Panasonic®

S-ICX

Integrated Voice & Data Solutions

Section 350 Installation Manual

WARNING: This service information is designed for experienced technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

This equipment is not designed for making emergency telephony calls when the power fails. Alternative arrangements should be made for access to emergency services.

S-ICX
Issued January 2000

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Parts Supplied with CCU

Following components are supplied and included in the box.

CABLE TIE	10 PCS	
BATTERY LEAD	1 PC	
EMI FILTER	3 PCS	
CABLE TIE	3 PCS	
DDK CONNECTOR	4 PCS	FOR 8 EXTENSION PORTS
MANUAL (PRINTED)	1 PCE	INSTALLATION MANUAL (UP TO CHAPTER 3)

Note:

CD-ROM manual which includes Operating manual, Installation manual and Programming manual is included in CPC card.

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About This Manual

Overview

This manual provides installation instructions for the Small Integrated Communication eXchange (S-ICX). Please carefully observe the contents of this manual.

The following table summarizes the purpose of each chapter.

Chapter No.	Title	Purpose
1	Requirements	Includes S-ICX model, information on the installation environment, and how to clean the S-ICX.
2	System Overview	Provides an overview of the S-ICX, including descriptions of the cabinet, system configurations, and unit cards.
3	Cabinet (CCU) Installation	Explains how to prepare for CCU installation, how to remove and replace the CCU cover, install the battery, and install cards.
4	Card Installation	Explains how to connect exchange lines and dedicated lines, how to connect different types of digital and analog internal lines, and how to mount telephones on the wall.
5	Peripheral Equipment	Describes how to install and connect DSS units, doorphone adaptors, and other peripheral equipment; also describes how to replace the backup battery of the CPC card.
6	Specifications	Lists the specifications of the equipment constituting the S-ICX.

Related Documents

- For instructions on S-ICX programming, see ***Section 400: Programming***.
- For detailed descriptions of S-ICX operations, see ***Section 700: Feature Operation***.

Chapter 1. Requirements

This chapter describes S-ICX model numbers, information on the installation environment, and instructions on how to clean the S-ICX.

Environmental Requirements

Temperature: The environment should be free from excessive temperatures in order to avoid component damage. Room temperature should be 32° to 104° Fahrenheit (0° to 40° Celsius).

Humidity: The environment should be free from excessive humidity, which may rust metallic parts and degrade performance. Do not install the system where humidity could condense on its surfaces. Relative humidity should range between 30 and 90 percent.

Ventilation: Adequate ventilation must be provided to allow upward air circulation through the cabinet grille.

Gas and airborne particles: To avoid corrosion or oxidation of electrical contacts, the environment should be free from airborne particles and corrosive gas.

Electrical noise: The environment should be free from excessive electrical noise, which could disturb the operation of digital circuits. The system should be located at least 10ft. (3m) away from welders, dimmers, or other high-current machines. Phones connected to the system should not be located near fluorescent lamps, air conditioners, washing machines, TVs, or radios.

Vibration: The environment should be free from excessive vibration, which could loosen components.

Water exposure: Because the S-ICX is an electrical device, exposure to water is dangerous. Do not place anything containing water on the system. Do not install under overhead plumbing, sprinkler system valves, or in areas that are susceptible to flooding.

Lighting: Sufficient lighting is required for testing and maintenance.

Lightning protection/grounding: The system must be properly grounded to protect it from lightning damage.

- Supplemental and independent equipment grounding conductors are to be installed between the system and the wiring system ground.

- One of the equipment grounding conductors must be a wire that is as thick or thicker than the ungrounded branch-circuit supply conductors. The equipment grounding conductor is to be installed as part of the circuit that supplies the system and is to be connected to a ground terminal at the service equipment. Bare, covered, or insulated grounding conductors should have a continuous outer finish that is green with yellow stripes. The equipment grounding conductor should be connected to a ground terminal at the service equipment.
- The attachment-plug receptacles of the same type as that used by the systems that are in the vicinity of the S-ICX are all to be of a grounding type, and the equipment grounding conductors serving these receptacles are to be connected to earth ground at the service equipment.
- A marking adjacent to the telecommunications jacks must instruct the user to connect grounding conductors for peripheral equipment before any telecommunication lines are connected to the product or system.

Cleaning

- Use a slightly damp cloth to clean the phones. The phones should never be cleaned with benzene, paint thinner, or other solvents.

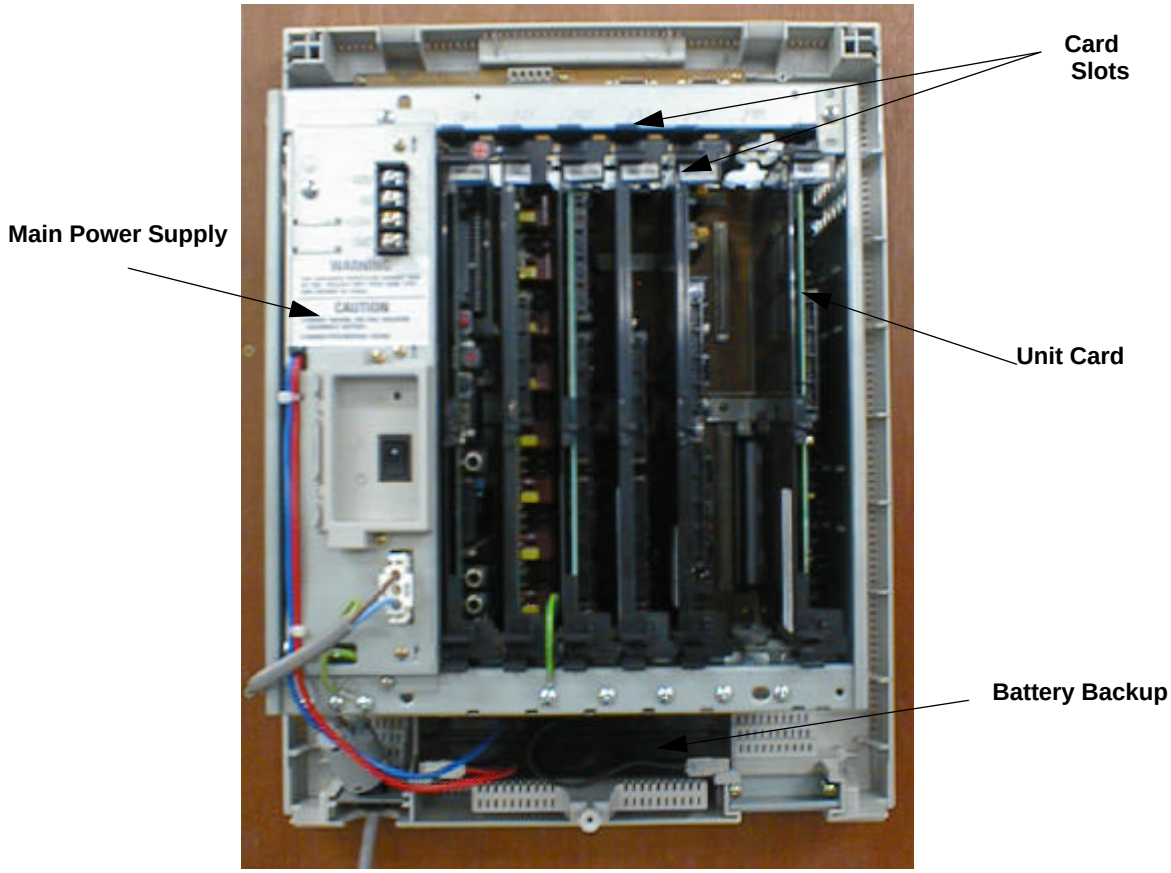
Chapter 2. System Overview

Panasonic's Small Integrated Communication eXchange (S-ICX) is a hybrid telephone system capable of supporting up to 132 ports.

The S-ICX cabinet includes the following:

- Power Unit
- Card Slots
- Unit Cards (optional)
- Backup Battery (VB-44026) (optional)
- 8 DEC card (as integrated slot 1)

Figure 2-1. The S-ICX CCU



Peripherals such as paging speakers, external music-on-hold sources, background music sources, PCs, printers, and Call Logging can be connected to the unit cards or the mother board.

Figure 2-2 shows the exchange line and extension line connections as well as some peripheral connections. Exchange and extension line connections are covered in detail in Chapter 4. Peripheral connections are covered in detail in Chapter 5.

List of Components

Table 2-1, 2-2, and 2-3 show the unit cards and packages that can be used with the S-ICX.

Table 2-1. Unit card configuration

Unit Type	Unit Desig.	Unit Name	Page No.	Product No.	Unit Description	Remarks
CCU	CAB-HD	Main Cabinet	3-2	VB-44030UK	Power Supply Unit and 8DEC are initially installed.	
Back-up Battery	BATT-S	Back-up Battery	3-5	VB-44026UK		

Table 2-2. Unit card configuration

Card Type	Card Desig.	Card Name	Page No.	Product No.	Card Description	Remarks
Processor Cards	CPC-HS	CPC-HS Card (S-ICX only)	4-6	VB-44440UK	Call processor card for 78-port system	32 Ext.
	CPC-HM	CPC-HM Card (S-ICX only)	4-6	VB-44441UK	Call processor card for 132-port system	64 Ext. Max.
Analog Exchange Lines	LTRK/8	Loop Start Exchange Line Card	4-7	VB-44510UK	8-port loop-start line	
	LTRK/4	Loop Start Exchange Card (S-ICX only)	4-7	VB-44514UK	4-port loop-start line	
	AC-15	AC15	4-19	VB-44570UK	4-port type AC-15 tie line exchange card	
Digital Exchange Lines	TBRI/4	T-point BRI Card	4-10	VB-44530	T-point ISDN interface ports	
	PRI/30	T/S-point PRI Card	4-13	VB-44540UK	T-point ISDN primary interface port and S-point primary interface port	
Digital Extension	DEC/8	Digital Extension Card	4-23	VB-44610UK	8-port digital extension card	
	DEC/16	Digital Extension Card (S-ICX only)	4-23	VB-44612UK	16-port digital extension card	Available for CPC-HM only.
	DEC/24	Digital Extension Card (S-ICX only)	4-23	VB-44613UK	24-port digital extension card	Available for CPC-HM only.
	SBRI/4	S-point BRI Card	4-33	VB-44630	S-point ISDN interface ports	
	PRI/30	T/S-point PRI Card	4-37	VB-44540UK	T-point ISDN primary interface port and S-point primary interface port	
Analog Extension	APEC/8	SBS Extension Interface Card	4-27	VB-44660UK	Interface card for SBS proprietary key telephone	
	SAEC/4	Special Analog Extension unit(S-ICX only)	4-31	VB-44621UK	4-port analog extension card including ringer circuit for IS2 slot	For IS2
	SAEC/8	Special Analog Extension Card (S-ICX only)	4-31	VB-44622UK	8-port analog extension card including ringer circuit for IS2 slot	For IS2
	AEC/8	Analog Extension Card	4-31	VB-44620UK	8-port analog extension card including ringer circuit	For FS1 to FS5
DTMF Circuits	MFR/8	8 DTMF Receiver Card	4-39	VB-44110UK	8-circuit DTMF receiver	
Interface cards	API	API Card	4-44	VB-44131	Applications Processor Interface card	Data for External Integrated VM or ACD products (FOR FUTURE USE)
	SAPI	Special API Unit (S-ICX only)	4-43	VB-44132	Internal Application Processor Interface unit	For IS2 Data for External Integrated VM or ACD products (FOR FUTURE USE)
	CONF	8-Party Conference Card	4-40	VB-44120UK	Interface card for 8-party conference interface	
Audio applications	VPU/4	Voice Processing Card/4	4-42	VB-44160UK	Voice processing card for Built-in ACD voice	
	ACD	ACD Card	4-41	VB-44140UK	Built-in ACD unit	

Card Type	Card Desig.	Card Name	Page No.	Product No.	Card Description	Remarks
Daughter package	SYNC	Sync. Package/Network Unit	4-17	VB-44460UK	Network sync circuit unit	Mounts on CPC-HS or CPC-HM card.

Table 2-3. Terminal Equipment configuration

Terminal Type	Terminal Desig.	Terminal Name	Page No.	Product No.	Terminal Description	Remarks
Phone System	TEL	12 Key Standard	4-26	VB-D411UK(B)		
	TEL	12 Key Display Speakerphone	4-26	VB-D411DSUK(B)		
	TEL	12 Key Large Display Speakerphone	4-26	VB-D411LDSUK(LDSUB)		
	TEL	12 Key Display Soft key Phone	4-26	VB-D411DSVUK		
	TEL	24 Key Display phone	4-26	VB-D611DUK		
	TEL	24 Key Display Speakerphone	4-26	VB-D611DSUK(B)		
	DSS	DSS	5-19	VB-D631UK(B)		
	EM24	EM24	5-20	VB-D331UK		
	VRADP	Voice Recognition Adaptor	5-16	VB-44101UK		
	SLTADP	One Line SLT Adaptor	5-24	VB-43702UK		
	DPH-ADP	Doorphone Adaptor	5-21	VB-3473UK		

System Capacity and Specifications

Table 2-4, 2-5, and 2-6 shows the Maximum System Capacities and Specifications.

***Table 2-4.* System Capacity**

	With CPC-HS	With CPC-HM
Exchange line ports Analog exchange AC15 BRI Circuits PRI	8x4+30=62 (including one PRI30) 40 20 20 30	8x3+30x2=84 (including two PRI30s) 40 20 20 60
Extension ports Proprietary telephone 2 wire telephone (SLT) DSS consoles	32 24 (8 initially installed) 24 (including SAEC/8) 4	64 56 (8 initially installed) 48 (including SAEC/8) 4
3 party conference	8	8
DTMF circuits	12 (4 initially installed)	12 (4 initially installed)
Paging Group Internal External	 10 (72 members 1 (5 relays)	 10 (72 members 1 (5 relays)
Speed Dial (Max 24 digits) System Personal	 800 20	 800 20
Grouping Operator Group Hunting Group Tenant Group MCO Group Pick upGroup	 1 (20 members) 12 (20 members) 12 99 12 (20 members)	 1 (20 members) 12 (20 members) 12 99 12 (20 members)
Camp-on (System Basis)	150	150
Call Back Internal (system) External (System)	 32 32	 32 32
Call Forward All (system) Busy (system) No Answer (system)	 144 144 144	 144 144 144

	With CPC-HS	With CPC-HM
Class of Service Internal External	 16 16	 16 16
TRS Class	50	50
ISDN Related Features DDI numbers (A/B) MSN	 96 96	 96 96
Account Code (Verified)	500 (10 digits)	500 (10 digits)
Absence Message	10 (16 digits)	10 (16 digits)
Text Message	10 (16 digits)	10 (16 digits)

Table 2-5. Dimensions and Weight

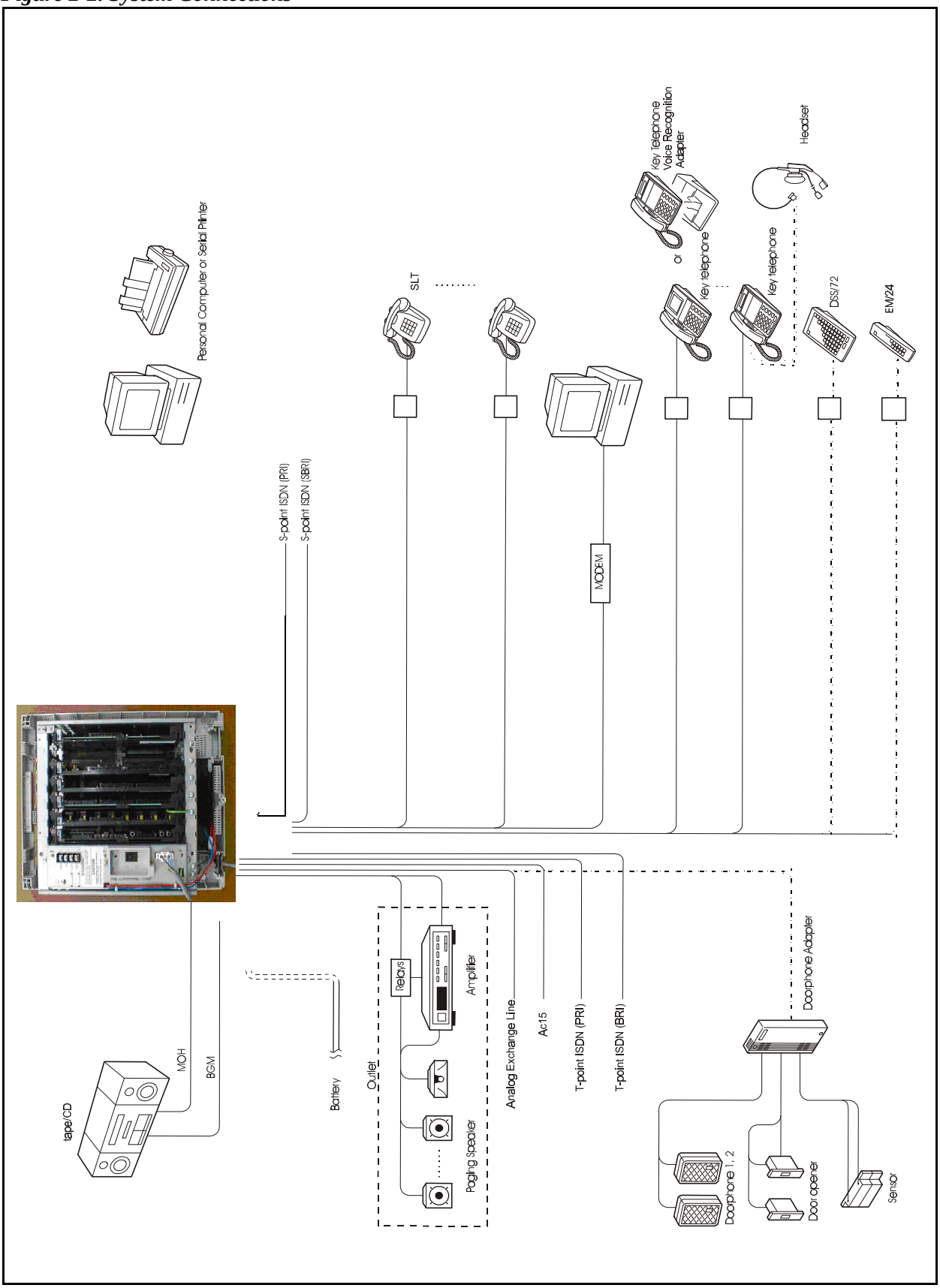
	S-ICX
Power Consumption CCU Proprietary tel	 336VA 2.7W
Dimensions (cm) CCU Proprietary tel	 W:360 x H:450 x D:220 W:186 x H:90 x D:233
Weight (kg) CCU Proprietary tel	 7 Kg 1 Kg

Table 2-6. Telephones can be connected to S-ICX

Interface Card Type	VB-44660 APEC/8 ▲	VB-44660 APEC/8 ▲	VB-44610 DEC/8 VB-44612 DEC/16 VB-44613 DEC/24
Model of Telephones connected via interface card	A series telephone VA-30920 VA-12020 VA-12022	SBS telephones VB-9211 VB-9211DS VB-9411 VB-9411DS VB-9411ADS	DBS/ICX telephones VB-3411 VB-3411DS VB-3411LDS VB-3611D VB-D411 VB-D411DS VB-D411DSV VB-D411LDS VB-D611D VB-D611DS

▲ Note: Some features may not be available due to limitations of legacy equipment.

Figure 2-2. System Connections



Chapter 3. Cabinet Installation

This chapter explains how to prepare for a single cabinet installation, how to remove and replace the cabinet cover, and how to install the battery, power supply, and cards.

Installation Location

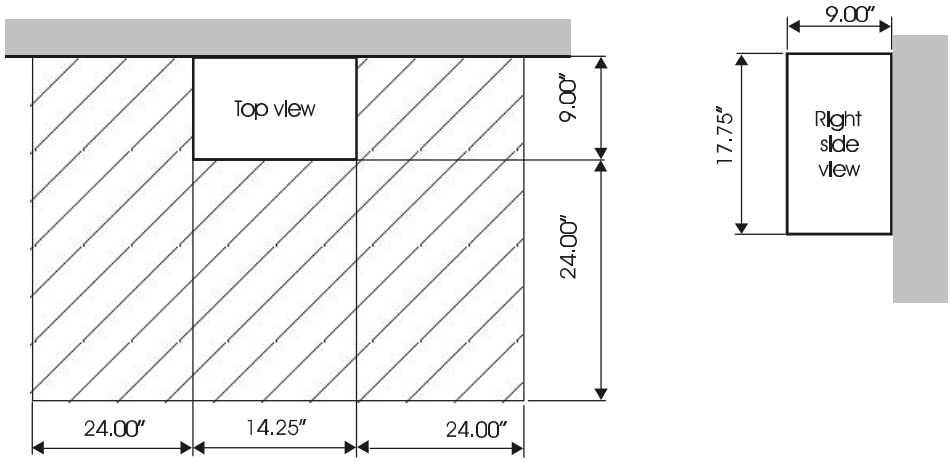
CAUTION:

- Turn the power switch and the external breaker OFF, and disconnect the AC cable before removing any covers.

Guidelines

- Before deciding where to install the single base cabinet, check the external dimensions shown below, the area required for maintenance, and the *"Environmental Requirements"* on page 1-2.

Figure 3-1. Single Base Cabinet dimensions and maintenance area



Notes:
-Hatched area ▭ indicates the area that should be provided for maintenance.

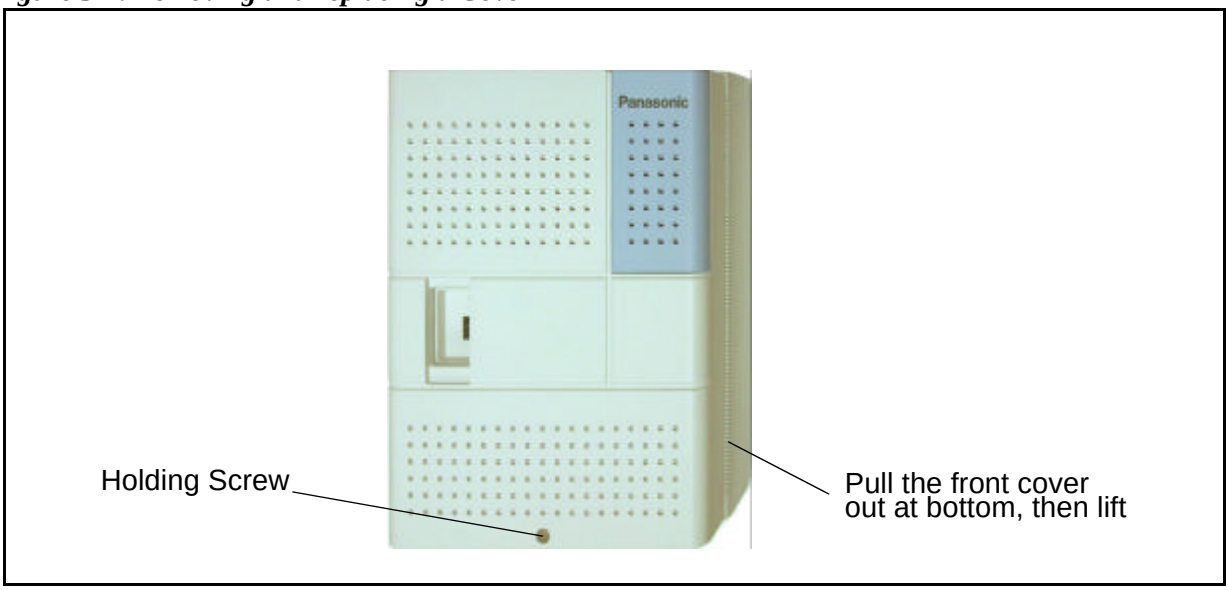
Removing and Replacing a Cover

1. Unscrew the front cover.
2. Pull the bottom of the front cover outward .

Note: Do not exert excessive force when pulling out the bottom of the front cover as doing so may damage the claw slots.

3. Gently lift the cover off by sliding it up and away.
4. To replace the cover, repeat above in a reverse order.

Figure 3-2. Removing and replacing a Cover



Cabinet Installation

Guidelines

⚠

CAUTION:

- Turn the power switch OFF, and make certain the AC cable is disconnected before installing the cabinet.
- Handle the cabinet carefully to avoid damage.
- The cabinet should be secured to a wall so that it does not topple in the event of earthquake, etc.
- Remove cabinet cover before installation (see page 3-2).
- If backup batteries have already been placed into the guides, remove them from the cabinet before installing.

Preparation

1. Hold the cabinet against the wall. Using a pen or pencil, mark the center of the wall visible through the top retaining screw holes on the cabinet's back plate and the lower center screw.

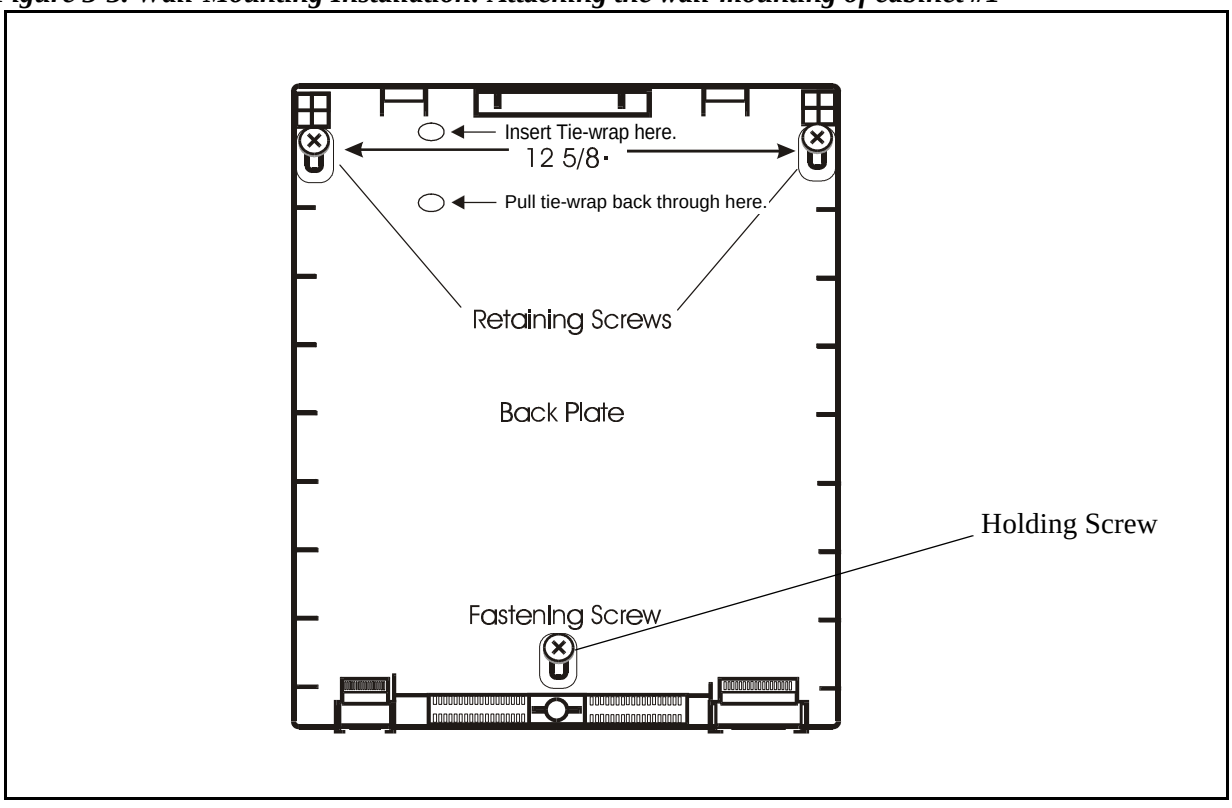
2. Mount the 2 wall-mounting screws (4 mm flat head screws recommended) using the marks on the plywood as a guide (32 cm apart). Leave approximately 2.5 cm of the screws protruding out of the wall.

3. Insert the pointed end of the tie-wrap into the top hole located on the top left side of the back plate, shown in Figure 3-4. When the tie-wrap has passed through the back plate, bend it down and push it back through the other hole in the back plate (and PCB).

4. Lift the back plate, and hook it onto the screws.

5. Completely tighten the screws.

Figure 3-3. Wall-Mounting Installation: Attaching the wall-mounting of cabinet #1



Connecting the AC Cable

Use BS1363 approved AC plug.
For pluggable equipment, that the socket-outlet shall be installed near the equipment and shall be easily accessible.
If a device other than a 13 Amp plug top is used as a disconnection device it must incorporate an all pole disconnection device.

The wires in this mains lead are coloured in accordance with the following code:

Green - and -yellow . . . . . .Earth (E)
Blue. . . . . .Neutral (N)
Brown . . . . . .Live (L)

As the colours of the wires in the mains lead of this equipment may not correspond with the coloured markings identifying the terminals in your connector proceed as follows:
The wire which is coloured green - and - yellow must be connected to the terminal which is marked by the letter E or by the safety earth symbol or coloured either green or green - and - yellow. The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red. This equipment must be earthed when it is connected to an AC mains outlet.

Grounding

Guidelines

⚠ **CAUTION:**

- Turn the power switch OFF, and make certain the AC cable is not plugged in before grounding the cabinet.
- Be sure to attach an EMI filter to the AC cable to reduce interference.
- For safety reasons, the S-ICX must remain grounded at all times. For permanent connection a readily accessible disconnect device shall be provided. If connection is made by domestic plug, the socket shall be near the equipment and shall be easily accessible.

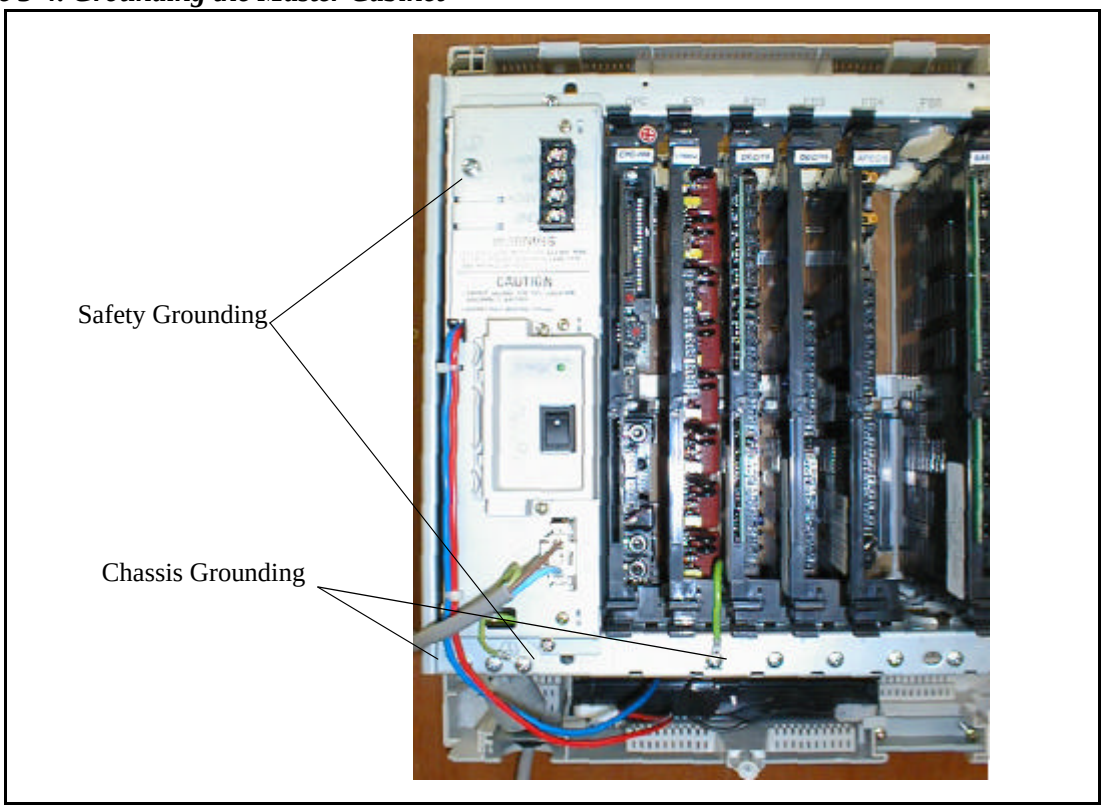
- The service ground cable must be 14 AWG minimum. It is recommend that the ground cable at least 12 AWG (stranded).
- Resistance to ground must be 0.1 Ohms or less.

Installation

1. Connect a permanent connection from the building service ground using a grounding wire to safety earth on the cabinet chassis. See Figure 3-4.

2. Install an EMI filter on the AC cable.

Figure 3-4. Grounding the Master Cabinet



Battery Backup (VB-44026UK)

Guidelines

⚠

CAUTION:

- Turn the power switch and the external breaker OFF, and disconnect the AC cable before installing the backup battery.
- Carefully note the polarity of the batteries to prevent shorting.
- Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

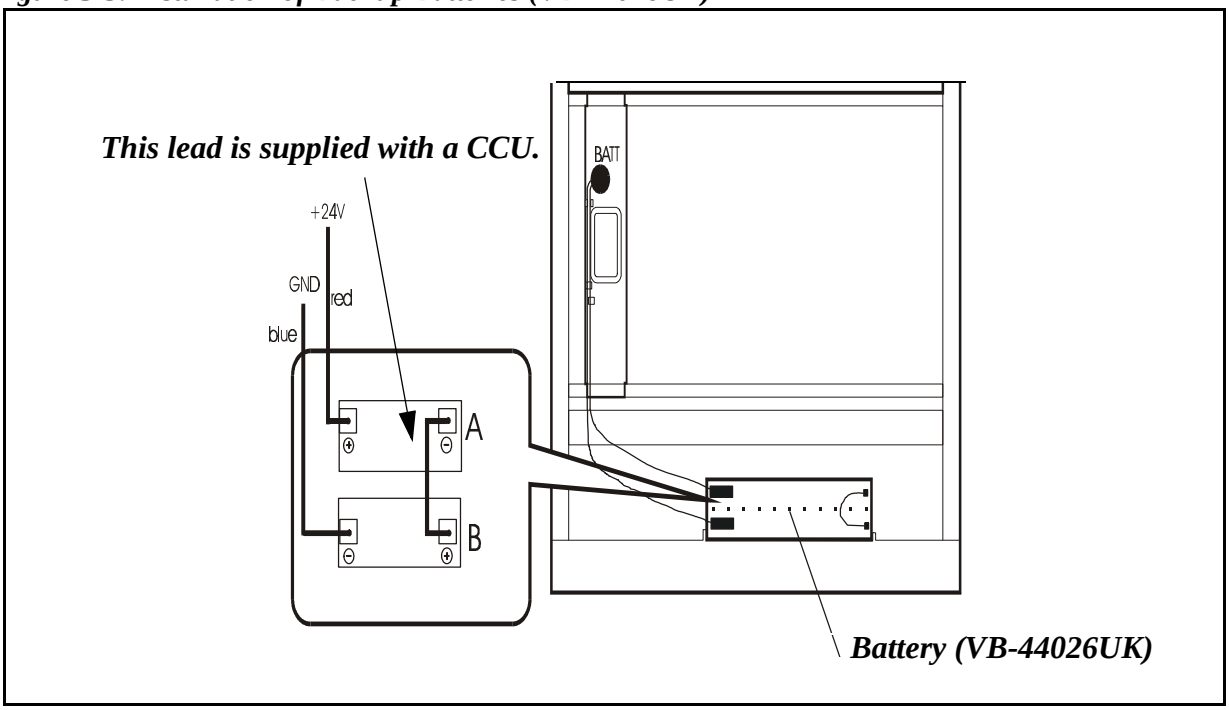
- The battery cable must be at least 18 AWG.
- During normal conditions, the backup batteries last for about 15 minutes.
- The backup batteries should be replaced about every 3 years.

Installation

1. Connect the red +24V cable to the + terminal of battery A.

2. Connect the blue GND cable to the - terminal of battery B.
3. Using the supplied battery cable connect the blue to the - terminal of battery A and red to the + terminal of battery B.
4. Slide the batteries into the guides in the cabinet.

Figure 3-5. Installation of Backup Batteries (VB-44026UK)



Chapter 4. Card Installation

This chapter explains how to connect ecxhange lines, how to connect different types of digital and analog extensions.

Card Installation

⚠

CAUTION:

- With the exception of selected cards as described in ’Maintenance Switches’ on page 4-4, many cards require power to be OFF before installing or removing the cards. Turn the power switch OFF and make certain the AC cable is disconnected before installing cards.
- Push the cards in so that they are securely seated. Failure to do so may result in the card being damaged or incorrect operation.
  The card circuits include CMOS-ICs, which are susceptible to damage by static electricity.
- To avoid damaging the CMOS-ICs, observe the following precautions when handling the cards:
  1) Touch a ground or the metal cabinet frame to discharge any static that may have built up on your body.
  2) Do not directly touch the CMOS-ICs or electrical conductors.

1. With the lettering on the card pointing up, slide the card into the guide of the card slot in the cabinet.
2. Hold the card on the top and bottom edges with both hands and carefully push it into the slot.
3. When the connector row at the far end of the card touches the corresponding connector on the unit, press the card in more firmly until it is seated.
4. Repeat steps 1 through 3 for all other cards.

About Marks Used in This Manual

Card names shown at the side of function titles indicate cards that must be mounted to enable connections.

Cards marked with an ⊗ at the side of the card name indicate that the card must not be removed or inserted while the power is ON.

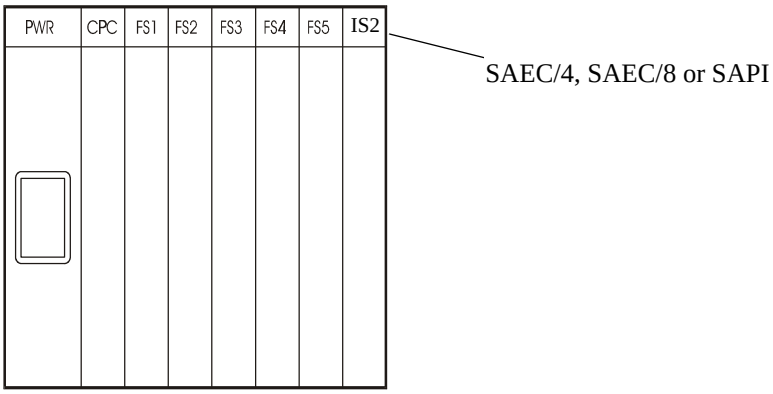
For details on removing and inserting cards, refer to *"Maintenance Switches"* on page 4-4.

Card Installation Positions

The unit cards are installed in the card slots in the S-ICX cabinet. Card Installation Positions in a system are shown below:

Figure 4-1. Card Installation Positions

Slot			Card
CPC			CPC-HS,CPC-HM
FS1 to FS5	Trunks	Digital	TBRI/4, PRI/30
		Analog	LTRK/4, LTRK/8, AC15
	Extensions	Digital	DEC/8, DEC/16, DEC/24, SBRI/4, PRI/30
		Analog	APEC/8, AEC/8
	Options/Audio		MFR/8, CONF
FS4	Applications		VPU/4
FS5			ACD
IS2			SAEC/4, SAEC/8, SAPI



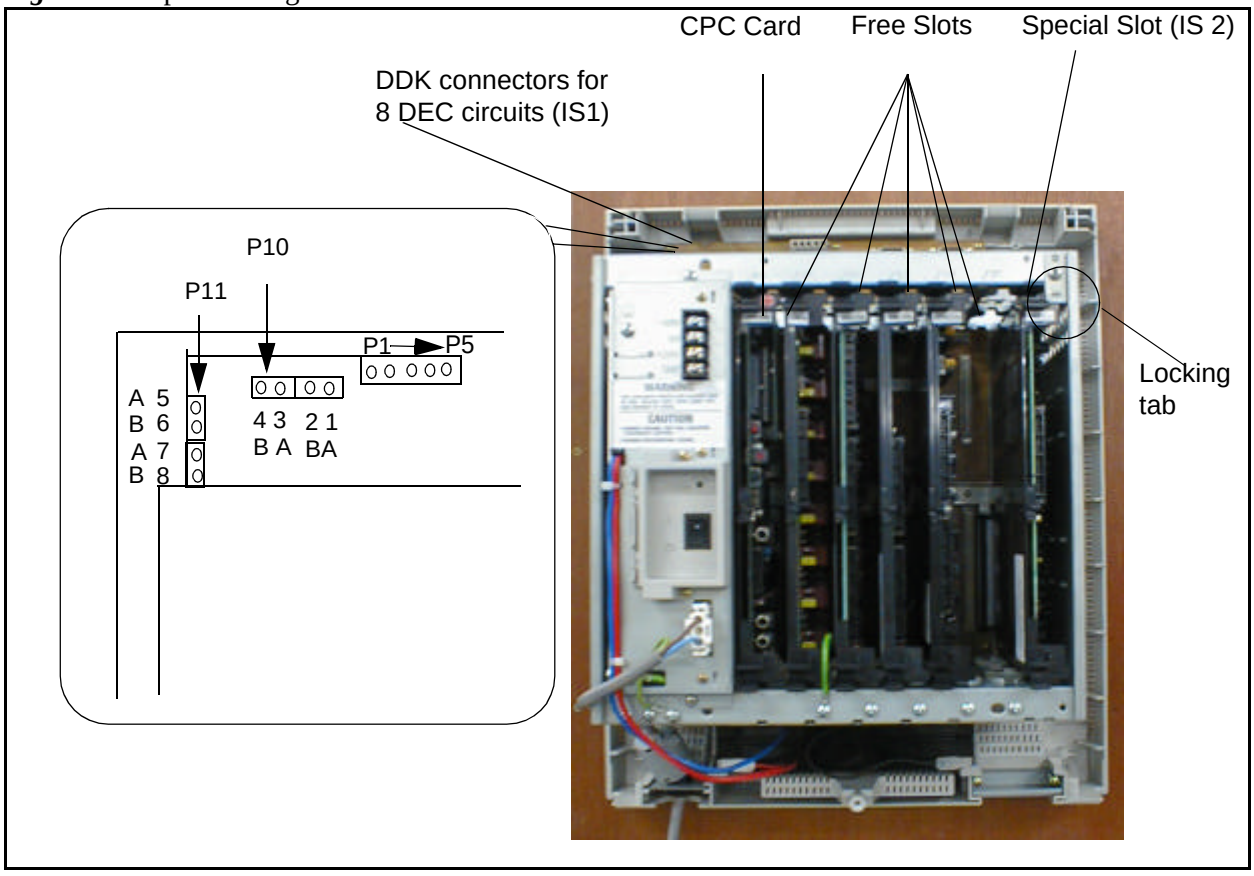
Special Integrated Slot 1 (IS1)

8 DEC circuits are integrated on a mother board with DDK connectors as shown above. These 8 DEC circuits are regarded as Integrated Slot(IS1) for programming only, there is no actual card slot.

Special Integrated Slot 2

The special integrated slot 2 (IS 2) is built into the mother board with a connector. The slot is reserved only for one SAEC/4, SAEC/8 or SAPI cards.

Figure 4-2. Special integrated slots.



SAEC/4, SAEC/8 and SAPI Installation

1. Remove the locking tab, located in the upper right corner, from the special IS 2 slot.
2. Slide the SAEC/4, SAEC/8 or SAPI card three-quarters of the way into the slot.
3. Attach the card ribbon cable to the connector on the backplane.
4. Slide the card into the slot until secure.
5. Reattach the special slot locking tab.

Maintenance Switches

Guidelines

CAUTION:

- Check that the line busy lamp is off before removing the card. If the lamp is on, the line will be disconnected when the card is removed.
- Check that the maintenance switch is off. After replacing the card in its slot on completion of the maintenance work.
- Never attempt to remove any of the following cards while the system is operating:
  - CPC-HS card, CPC-HM card
  - VPU/4 card
  - ACD card
  - API card, SAPI card
  - SAEC/4 card, SAEC/8 card

- The following cards can be removed from and replaced in their slots even when the system is operating (power is on) provided the maintenance switch is set to ON (up).

  • LTRK/8 card, •LTRK/4 card, •AC15 card
  • TBRI/4 card, •PRI/30 card

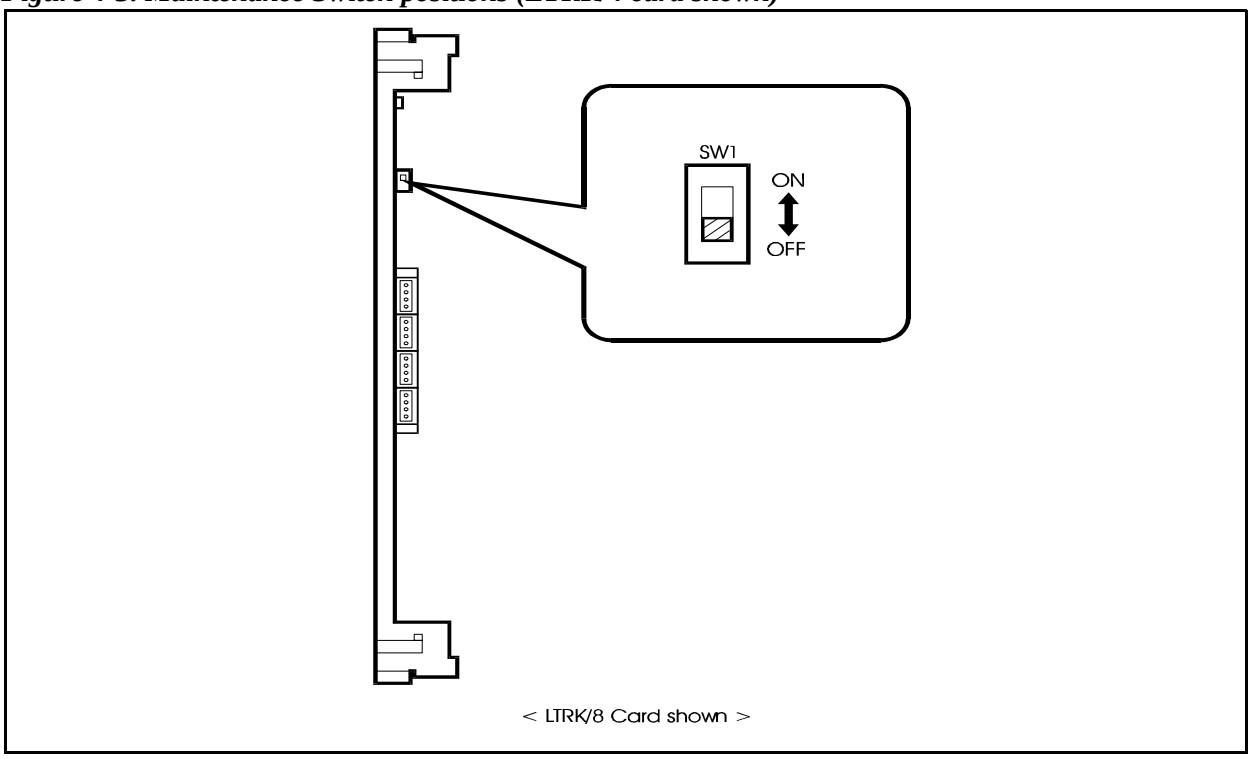
- When the maintenance switch is on, the cards are in the following state:

  • Incoming calls are ignored;
  • Outgoing calls are prevented;
  • The line is disconnected on completion of any current call. So, additional incoming calls are ignored and outgoing calls are prevented as soon as any current call is completed.

  The cards can be removed as soon as all circuits on the card are idle and the busy lamps are off.

Note: The cards for extension line (DEC/8, DEC/16, DEC/24, AEC/4, AEC/8, APEC, SBRI/4, MFR/8, and CONF Card) can be removed and replaced while the system is operating. Because there are no busy lamps for calls on extension lines, however, you cannot check the status of these lines. It is recommended that you announce using paging, before removing the cards, to warn users that the lines will be disconnected.

Figure 4-3. Maintenance Switch positions (LTRK/4 card shown)



- Cards for the following extension lines can be removed and replaced while the system is operating.

• DEC/8 card,	• DEC/16 card,	• DEC/24 card
• AEC/8 card	• SBRI/4 card	• MFR/8 card
• CONF card	• APEC/8 card	

Note: Because there are no busy lamps for calls on extension lines, you cannot check the status of these lines. We recommend using paging, before removing the cards, to warn users that the lines will be disconnected.

CPU card

CPC-HS card (VB-44440UK), CPC-HM card (VB-44441UK)

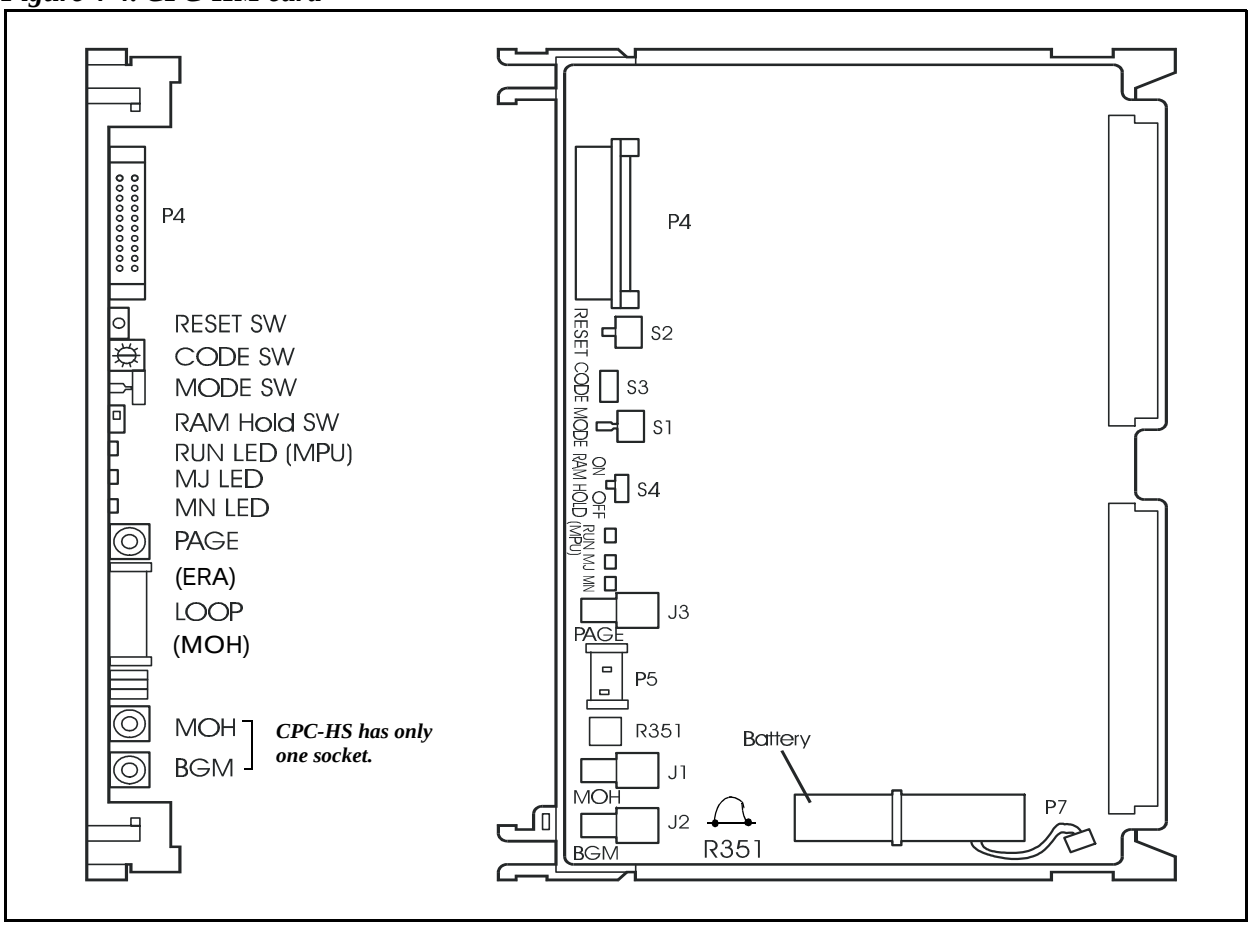
CPC-HS/-HM ⊗

The CPC-HS card is a standard CPU card for systems supporting up to 32 extensions, and up to 78 ports. This card incorporates a 16-bit CPU.

The CPC-HM card is a high-level CPU unit for a system with up to 64 extensions, and up to 132 ports.

The CPC card provides a time switch (9 HW x 9 HW), time switch, 4 sets of 3-party conference circuits, service tone, a DTMF transmitter, an input terminal for external Music-On-Hold and BGM source (RCA jack), EPA output (RCA jack), a connecting terminal for synchronization package (VB-44460UK), and an interface connector for a compact flash card. The system control program is downloaded to the internal memory of the system through the compact flash card. Memory is retained with a backup battery.

Figure 4-4. CPC-HM card



Note: CPC-HS does not have a BGM socket. A MOH socket is used for both BGM.

R351 = EPA output impedance (600Ω/high-impedance) setting (page 5-5)

The following tables show switch settings and LED indicators for the CPC card.

Table 4-1. Switch settings of CPC card

SW No.	Description
S1 : Black (MODE)	Push switch for setting modes of system.
S2 : Red (RESET)	Push switch for resetting.
S3 : (CODE)	Rotary switch for setting startup mode of system.
S4 : (RAM HOLD)	Switch for selecting battery backup of memory.

Table 4-2. LED indications of CPC card

LED indication	Description
(RUN)	Flashes red when Main Processing Unit (MPU) is operating.
(MJ)	Turns ON red when Major (MJ) alarm is detected.
(MN)	Turns ON red when Minor (MN) alarm is detected.

Exchange Lines

The following cards are used with exchange lines:

- LTRK/8: Loop start exchange line interface card (8 ports)
- LTRK/4: Loop start exchange line interface card (4 ports)
- TBRI/4: T-point ISDN basic interface card (4 ports)
- PRI/30: T-point and S-point ISDN primary rate interface card (1 port)
- AC15/4: AC-15 tie line interface card (4 ports)

Install the correct type of cards in the CCU for the exchange lines that are to be connected, then connect the exchange lines.

Loop Start Exchange Line card

LTRK/4&8

LTRK/4 card (VB-44514UK)
LTRK/8 card (VB-44510UK)

Guidelines

- Loop Start exchanges are connected to a LTRK/4 card(VB-44514UK) or LTRK/8 card(VB-44510UK) installed in a flexible slot of the CCU. The LTRK/4 card provides for maximum of 4 exchange lines, and the LTRK/8 card provides 8 exchange line connections.

- The maintenance switch(SW1) on the LTRK/4 or LTRK/8 card can be set so that the card can be removed and installed while the systenm is operating. See page 4-2 for details on the maintenance switch.
- Table 4-1 shows the maximum numbers of cards and exchanges per system type.

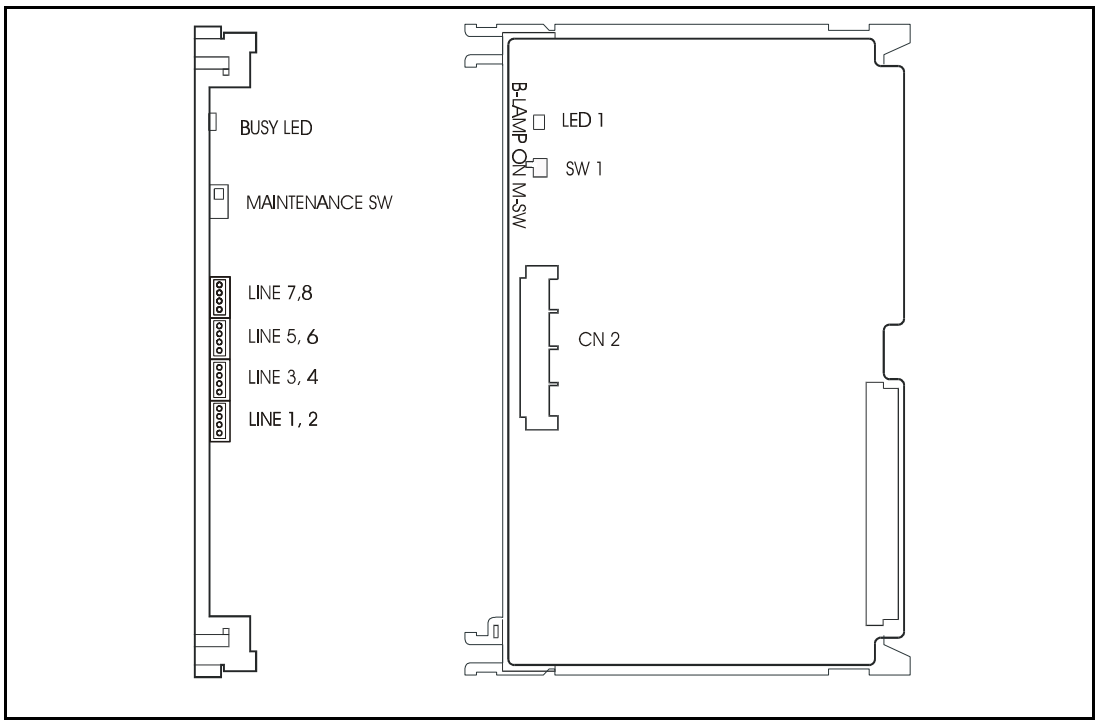
Table 4-3. Maximum Loop Start Exchanges per system

System Type	Maximum Number of Cards	Maximum No. of Loop Start Exchange Lines
78 ports (CPC-HS)	5	1-40
132 port (CPC-HM)	5	1-40

The LTRK/8 card provides an 8 exchange line interface. It provides a lightening arrestor and a safety circuit to directly connect with general telephone lines.

The LTRK/4 card provides an 4 exchange line interface. It provides a lightening arrestor and a safety circuit to directly connect with general telephone lines.

Figure 4-5. LTRK/8 card



The following tables show switch settings and LED indications for the LTRK/4 card.

Table 4-4. Maintenance switch (SW1) settings of LTRK/8 card

Setting	Description
ON	Card is in closed status, and can be mounted and removed when power is ON. (Sending/receiving of calls is disabled. If this is set during speech, sending/receiving of calls is disabled after the call ends.)
OFF (**M-SW**)	Normal operation (This switch is set to OFF for normal operation.)

Table 4-5. LED indications of LTRK/8 card

LED indication	Description
LED1 (LINE BUSY)	Turns ON when any exchange line on the card is in use.

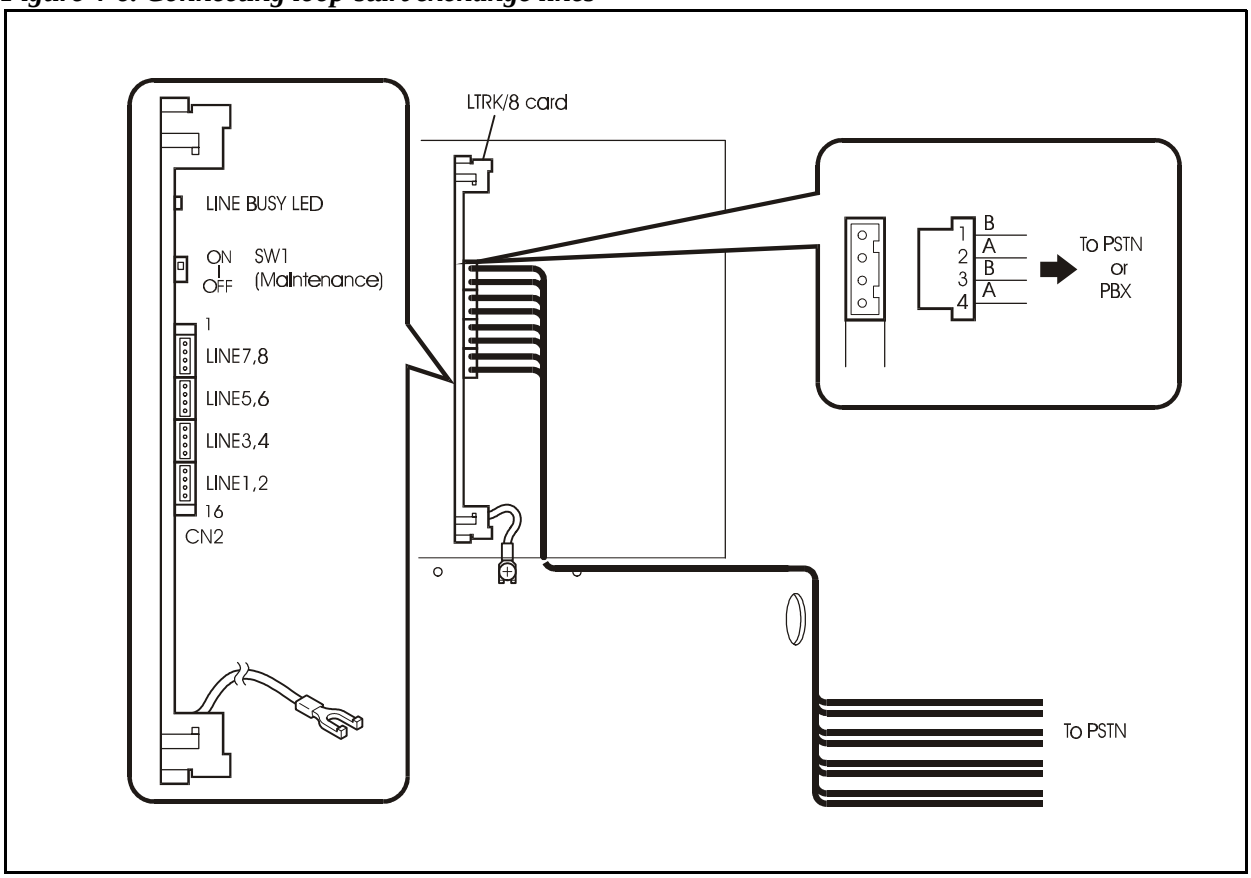
Table 4-6. Pinout of DDK connector (CN3) on LTRK/8 card

CN No.	Line No. (DDK No.)		Pin No.	Exchange Line No.	Signal
CN2	4	1	1	8	B
		2	2		A
		3	3	7	B
		4	4		A
	3	1	5	6	B
		2	6		A
		3	7	5	B
		4	8		A
	2	1	9	4	B
		2	10		A
		3	11	3	B
		4	12		A
	1	1	13	2	B
		2	14		A
		3	15	1	B
		4	16		A

Installation

1. Install the LTRK/4 or LTRK/8 card in any available flexible slot.
2. Connect one DDK connector per two exchange lines.
3. Pass the exchange lines with the DDK connectors through the wiring slot in the CCU and connect them to the DDK connector on the LTRK/4 or LTRK/8 card.
4. Connect FG(CCU) with LTRK/4 or LTRK/8 card using a screw and washer.

Figure 4-6. Connecting loop-start exchange lines



T-Point ISDN Interface card
TBRI/4 card (VB-44530UK)

TBRI/4

Guidelines

- T-point ISDN Basic Rate is accommodated by the TBRI/4 card which is installed in a flexible slot. Four T-point ISDN lines can be connected to each TBRI/4 card.
- T-point ISDN is connected via a Network Termination Unit (NT1).
- T-point ISDN is connected to the TBRI/4 card using RJ-45 connector. See Figure 4-4 for the pin configuration of the RJ-45 connectors.
- The TBRI/4 card can be attached or detached when the power is turned ON by setting the maintenance switch (SW4). See page 4-4 for details.
- When using T-point ISDN, you must install the synchronization package (VB-44460UK) on a CPC-HS or CPC-HM card.
- Table 4-3 shows the maximum number of cards that can be installed with each CPC size.

Table 4-7. Maximum Number of T-Point ISDN interfaces per system

System Type (Processor)	Maximum Cards	Maximum Lines (No. of channels)
78 ports (CPC-HS)	5	20/(40ch)
132 ports (CPC-HM)	5	20/(40ch)

Figure 4-7. TBRI/4 card

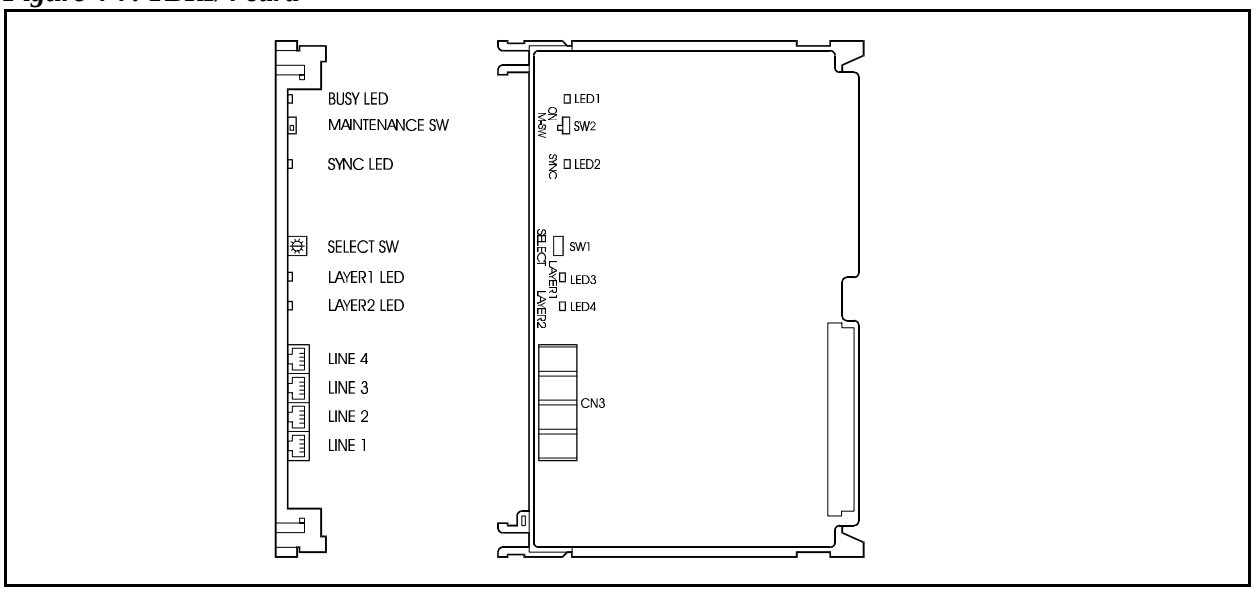


Table 4-8. Maintenance switch (SW2) settings of TBRI/4 card

Setting	Description
ON	Card is in closed status, and can be mounted and removed when the power is ON. (Sending/receiving of calls is disabled. If this is set during speech, sending/receiving of calls is disabled after speech ends.)
OFF	Normal operation (This switch is set to OFF for normal operation.)

Table 4-9. LED indication of TBRI/4 card

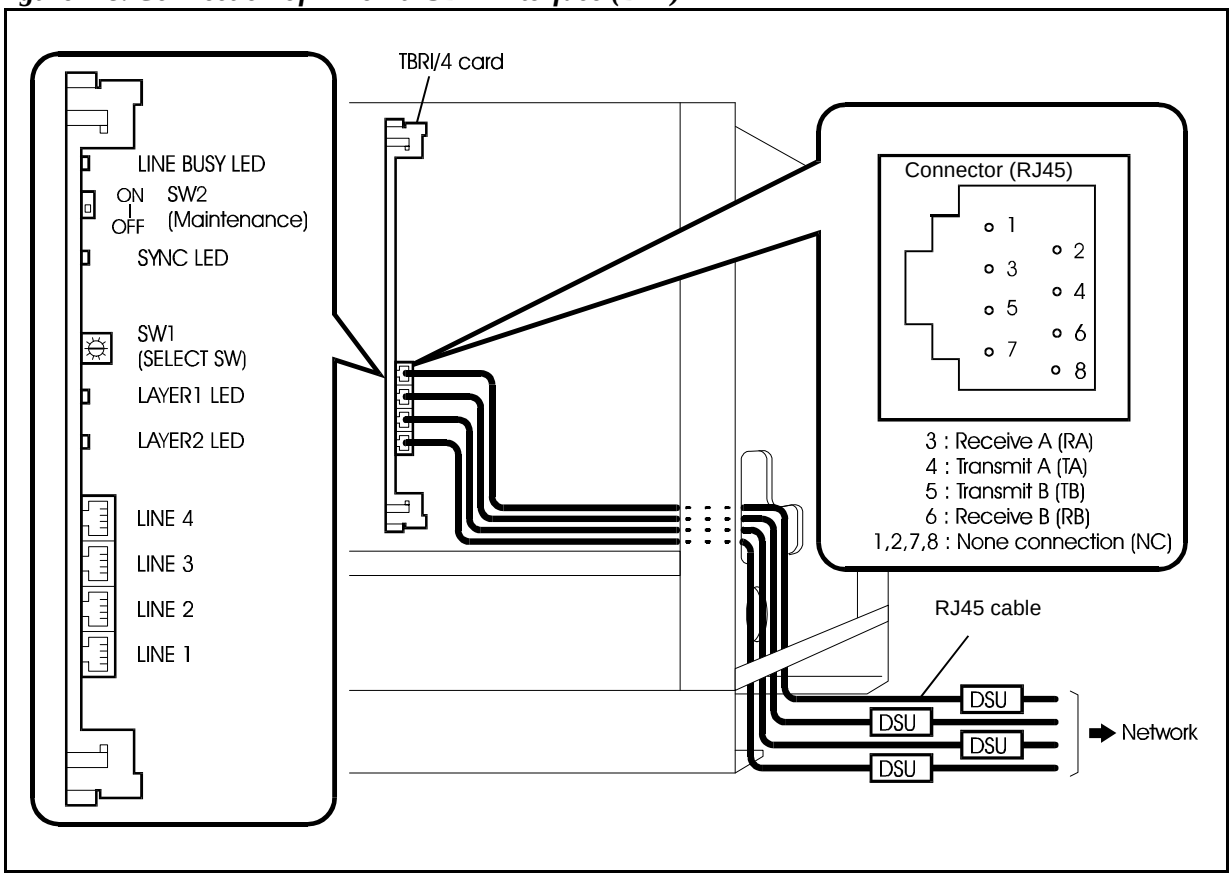
Switch position	LED indication
0	OFF (default setting when unit is shipped)
1	1st interface condition displayed by LAYER1 LED and LAYER2 LED
2	2nd interface condition displayed by LAYER1 LED and LAYER2 LED
3	3rd interface condition displayed by LAYER1 LED and LAYER2 LED
4	4th interface condition displayed by LAYER1 LED and LAYER2 LED
5 to 9	Not available

- ***Circuit select switch (SW1) settings of TBRI/4 card***
  SW1 of the TBRI/4 enables you to display the status of the each interface condition using LAYER1 LED (lights in red when synchronization is completed) or LAYER2 LED (lights in red when DL (Data Link) is completed).
  Four lines on one single card are connected to an ISDN of the same station. Therefore, the remaining synchronizations are automatically completed when synchronization has been completed in any one of the lines. Table shows the settings of the line selection switch. Line Selection Switch (SW1: SELECT) on TBRI/4 card TBRI/4 card.

Table 4-10. LED indication of TBRI/4 card

LED indication	Description
LED1 (LINE BUSY)	Turns ON when exchange line is in use.
LED2 (SYNC)	Turns ON when network synchronisation clock is sent.
LED3 (LAYER1)	Turns ON when synchronisation is established.
LED4 (LAYER2)	Turns ON when data link (DL) is established.

Figure 4-8. Connection of T-Point ISDN Interface (BRI)



T-Point ISDN Interface card

TPRI/30

TPRI/30 card (VB-44540UK)

Guidelines

- The T-point ISDN primary rate interface is accommodated on the PRI/30 card which is installed in a flexible slot. You can connect one T-point ISDN primary rate interface carrier to each PRI/30 card.
- By setting the switch and reprogramming, the PRI/30 card can also be set up as an S-point ISDN primary rate or Q-SIG interface.
- The T-point ISDN primary rate interface connects to the switched network via a subscriber unit.
- Depending on Dip switch SW2-2, the PRI/30 card can be set for "8-channel mode" or "Other mode". When set for "Other mode" by Dip switch, you can also specify three channel classifications: "1 to 16B+D", "1 to 24B+D"or "1 to 30B+D" by system configuration programming.

  Table 4-11 shows the mode settings of the PRI/30 card.

Table 4-11. Mode Settings of PRI/30 card

Card Name	Switch Setting Mode	Card Assignment/ No. of Channels Used
PRI/30 card (Primary Rate Interface)	8ch mode	PRIT/8: 1 to 8B+D
	Other mode	PRIT/16: 1 to 16B+D
		PRIT/24: 1 to 24B+D
		PRIT/30: 1 to 30B+D

- The T-point ISDN primary rate interface carrier line uses an 8-conductor modular connector RJ45 connected to the PRI/30 card. See Figure 4-5 on page 4-8 for the pin configuration of the 8-conductor modular connectors.
- The PRI/30 card can be attached or detached when the power is turned ON by setting the maintenance switch (SW3). See page 4-4 for details.
- When installing a T-point ISDN primary rate interface, install the synchronization package on the CPC-HS or CPC-HM card.
- The following table shows the maximum number of T-point ISDN primary rate interfaces that can be installed in each system size.

Table 4-12. Maximum number of T-Point Primary Rate Interface cards per system

System Type	Maximum Cards	No. of B-channels
78 ports (CPC-HS)	1	30ch x 1=30ch
132 ports (CPC-HM)	2	30ch x 2=60ch
78 ports (CPC-HS)	5	8ch x 5=40ch
132 ports (CPC-HM)	5	8ch x 5=40ch

Figure 4-9. PRI/30 card

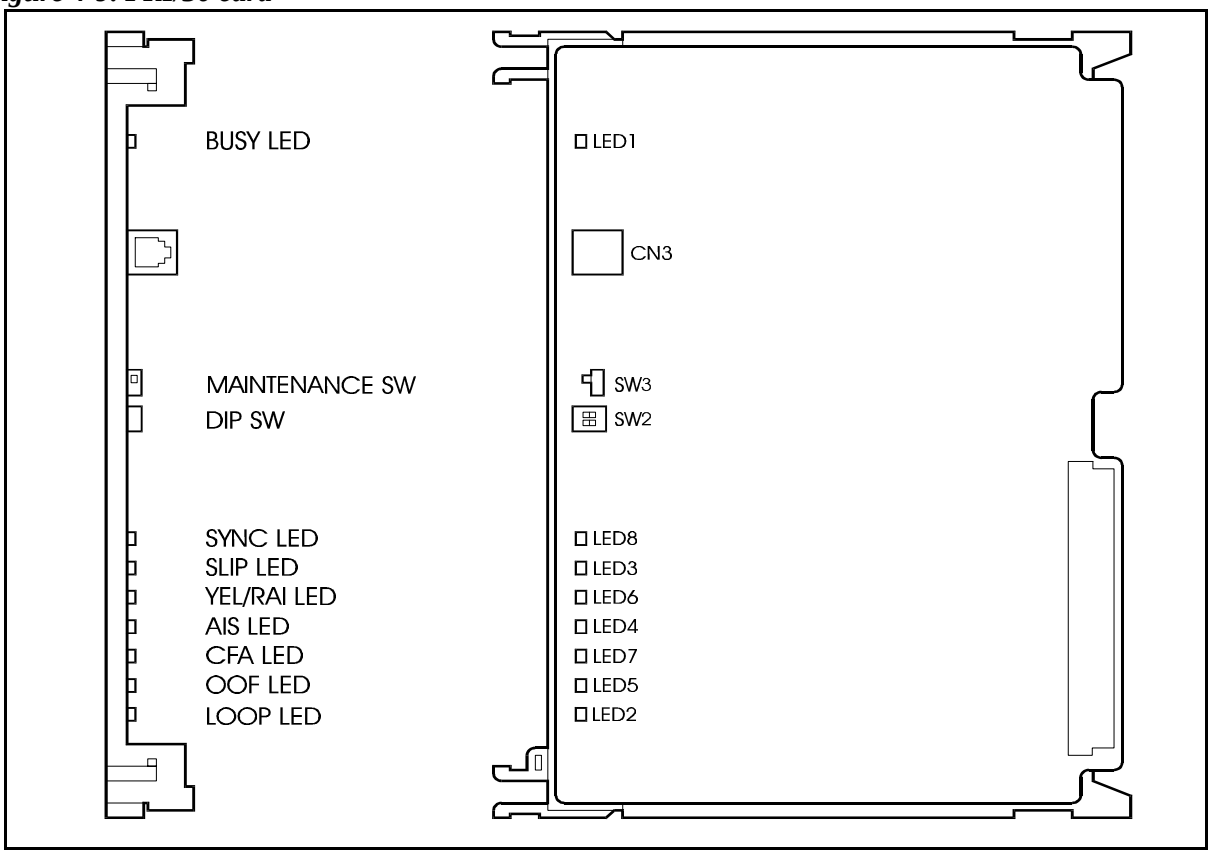


Table 4-13. Maintenance switch (SW3) settings of PRI/30 card

Setting	Description
ON	Card is in closed status, and can be mounted and removed when power is ON. (Sending/receiving of calls is disabled. If this is set during speech, sending/receiving of calls is disabled after speech ends.)
OFF	Normal operation (This switch is set to OFF for normal operation.)

Installation of Sync. Package

1. Align the connector (P1) of the CPC-HS or CPC-HM card with the holes of spacers and connect the SYNC synchronization package. See Figure 4-12 on page 4-18 for how to install the SYNC synchronization package.
2. Insert the CPC-HS or CPC-HM card in the specified slot.
3. Set the DIP switch (SW2-1) of the PRI/30 card ON (exchange).
4. Set the DIP switch (SW2-2) of the PRI/30 card as shown in Table 4-6.

Table 4-14. Switch setting for SW2 on PRI/30 Card

Switch No.	Function	
SW2-1	ON	Set to "Exchange" for T-point.
	OFF	Set to "extension" for S-point.
SW2-2	ON	Set to "Other mode". Can be used with the programmed number (1 to 16B+D or 1 to 30B+D) of channels.
	OFF	Set to "8-channel mode". Can be used with 1 to 8B + D channels.

5. Set SW1 on the PRI/30 card according to the following table.

   Note: These switch settings correspond to the distance between the S-ICX and the CSU. To turn a switch on, set it to the "up" position.

Table 4-15. Switch settings for SW1 on the PRI/30 card

Switch No.	Distance from the S-ICX to the CSU		
	0 to 150 ft. (45m)	150 to 450 ft. (45m to 135m)	450 to 655 ft. (135m to 200m)
SW1-1	ON	OFF	OFF
SW1-2	OFF	ON	OFF
SW1-3	OFF	OFF	ON
SW1-4	OFF	ON	OFF
SW1-5	OFF	OFF	ON
SW1-6	OFF	ON	OFF
SW1-7	OFF	OFF	ON
SW1-8	Not used		

6. Insert the PRI/30 card into the specified flexible slot (see page 2-16)
7. Connect the 8-conductor modular jack (RJ45) via the CSU to the T-point ISDN primary rate carrier line.
8. Pass the T-point ISDN rate carrier wires with 8-conductor modular jack (RJ45) through the wiring aperture of the cabinet and connect it to the modular connector on the PRI/30 card.

Figure 4-10. Connection of T-Point ISDN Primary Rate Interface (PRI)

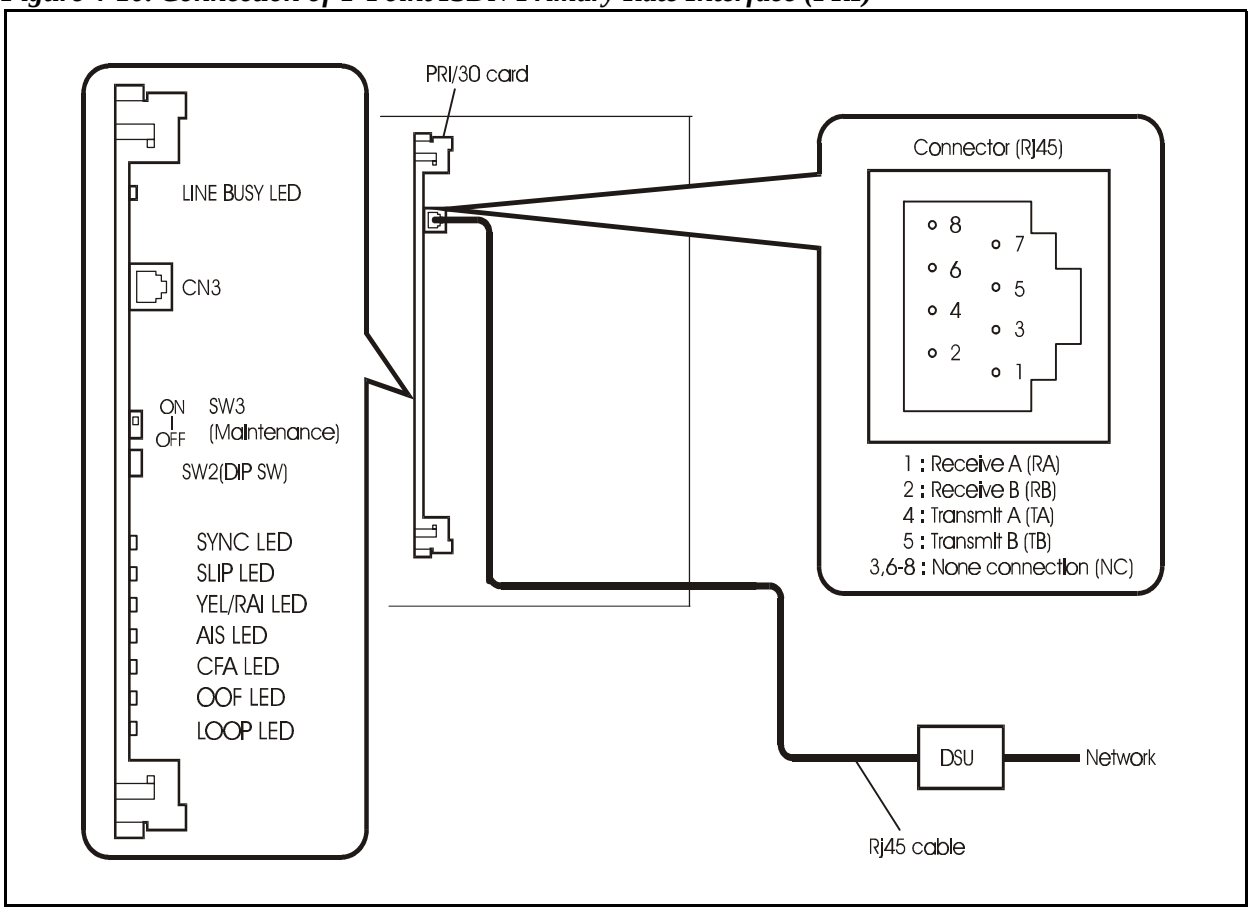


Table 4-16. LED indications of PRI/30 card

LED indication	Description
LED1 (LINE BUSY)	Turns ON when B channel is in use.
LED8 (SYNC)	Turns ON when set to abstracting Network synchronising clock.
LED3 (SLIP)	Turns ON when SLIP abnormality is detected.
LED6 (YEL/RAI)	Turns ON when receiving YELLOW alarm signal.
LED4 (AIS)	Turns ON when receiving AIS signal.
LED7 (CFA)	Turns ON during RED alarm.
LED5 (OOF)	Turns ON when frame failure is detected.
LED2 (LOOP)	Turns ON when loop back. (Connect TA, TB to RA, RB for test purpose.)

SYNC Package/Network Unit

SYNC

SYNC package (VB-44460UK)

The SYNC package supplies a network synchronizing circuit, and is required when a digital circuit, such as ISDN, is used.

The SYNC package generates a PCM clock that is synchronized with a digital network by the PLL circuit, supplying the PCM clock to the CPC-HS or CPC-HM card.

The SYNC package is mounted on either the CPC-HS or CPC-HM card.

For details on how to mount the SYNC package, see page 4-18.

Figure 4-11. SYNC Package

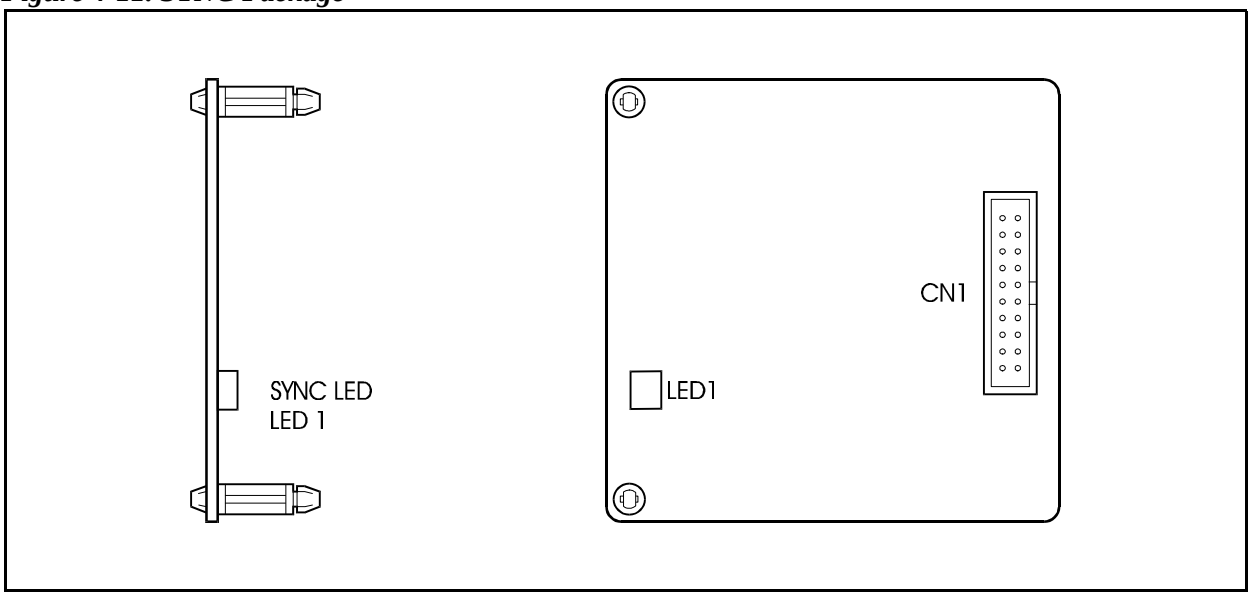


Table 4-11 shows the LED indications.

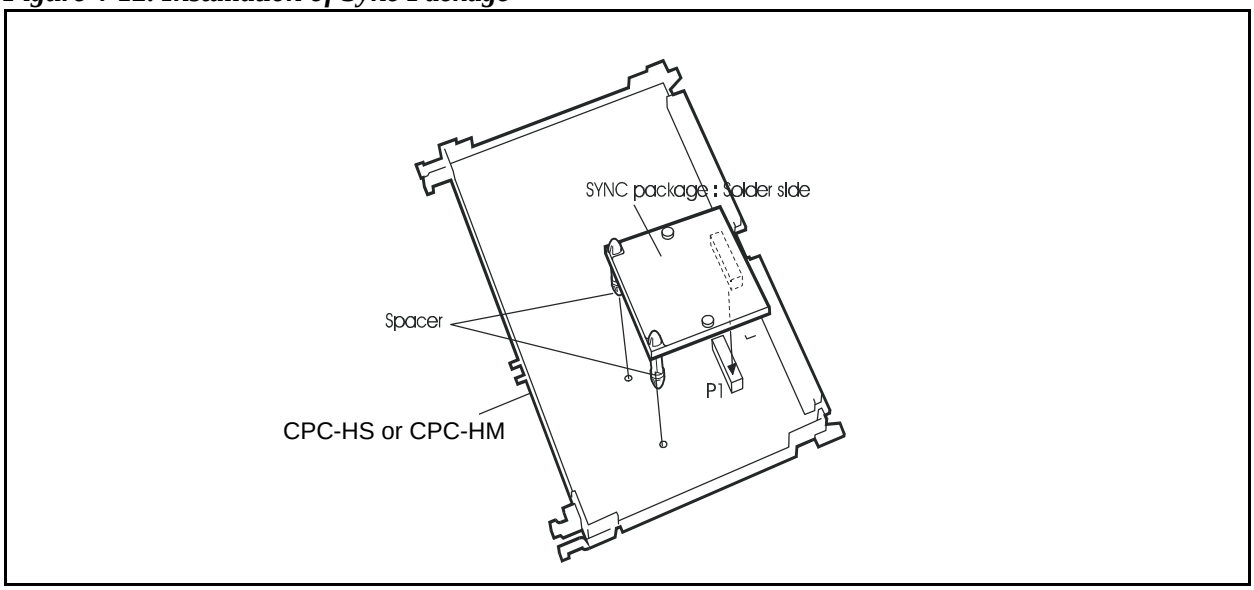
Table 4-17. LED indications of SYNC package

LED indication	Description
LED1 (SYNC)	Turns on when synchronizing to the CO clock.

Installation

1. Align the connector (P1) of the CPC-HS card or CPC-HM card with the holes of spacers and connect the synchronization package (VB-44460UK).

Figure 4-12. Installation of Sync Package



2. Insert the CPC-HS or CPC-HM card in the specified slot.
3. Insert the TBRI/4 card or PRI 30 card in an available flexible slot.
4. Connect the 8-conductor modular jack (RJ45) via the NT1 to the T-point ISDN interface.
5. Pass the T-point ISDN wires with 8-conductor modular jack (RJ45) through the wiring aperture in the main unit and connect it to the modular connector on the card.

AC15 Tie Line Interface

AC15 card (VB-44570UK)

AC15/4

Guidelines

- AC-15 tie lines are connected to the AC15/4 card installed in a flexible slot. You can connect four AC-15 tie lines to each AC15/4 card.
- Connect the AC-15 tie lines to the AC15/4 card using a DDK connector.
- The AC15/4 card can be installed and removed when the power is turned ON by using the maintenance switch (SW1).
- The table below shows the maximum number of cards and lines that can be installed in each system.

Table 4-18. Maximum number of AC-15 tie lines per system

System Type	Maximum Cards	Maximum Lines (No. of channels)
78 ports (CPC-HS)	5	1-20
132 ports (CPC-HM)	5	1-20

- The table below shows the pin configuration of the DDK connector (CN3) on the AC15/4 card.

Table 4-19. Pin Configuration of DDK Connector (CN3) on AC15/4 Card

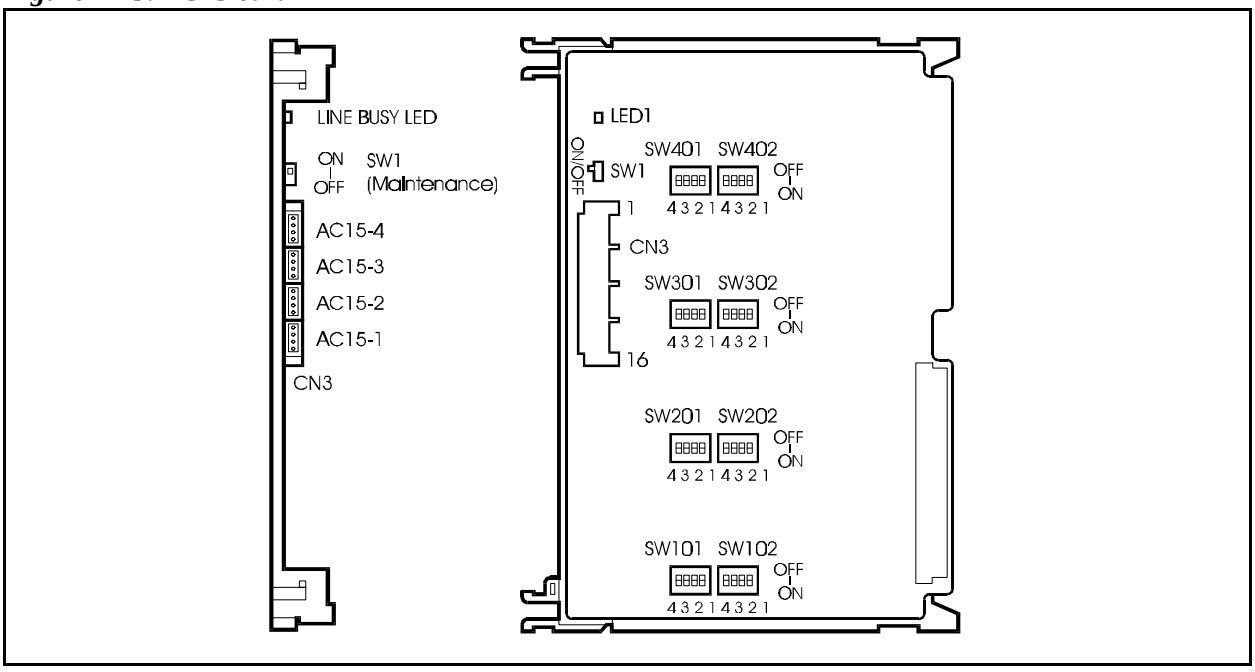
CN No.	Circuit No. (DDK No.)		Terminal No.	Signal name
CN3	4	1	1	TX2
		2	2	TX1
		3	3	RX2
		4	4	RX1
	3	1	5	TX2
		2	6	TX1
		3	7	RX2
		4	8	RX1
	2	1	9	TX2
		2	10	TX1
		3	11	RX2
		4	12	RX1
	1	1	13	TX2
		2	14	TX1
		3	15	RX2
		4	16	RX1

The AC15 card has four AC-15 tie line interfaces, and handles the following:

- detection and response to call signals from other PBXs
- outgoing calls to the AC-15 tie line
- dial transmission
- conversations

As the AC15 card has a built-in lightning protector, it can be connected directly to the AC15 circuit.

Figure 4-13. AC15 card



Tables 4-20, 4-21 and 4-22 show the switch settings and LED indications.

Table 4-20. Maintenance switch (SW1) settings of AC15 card

Setting	Description
ON	Card is in closed status, and can be mounted and removed when the power is ON. (Sending/receiving of calls is disabled. If this is set during speech, sending/receiving of calls is disabled after speech ends.)
OFF	Normal operation (This switch is set to OFF for normal operation.)

Installation

1. Set the dip switches on the AC15/4 card as indicated in the table below.

Table 4-21. AC15/4 Card Dip Switch Settings

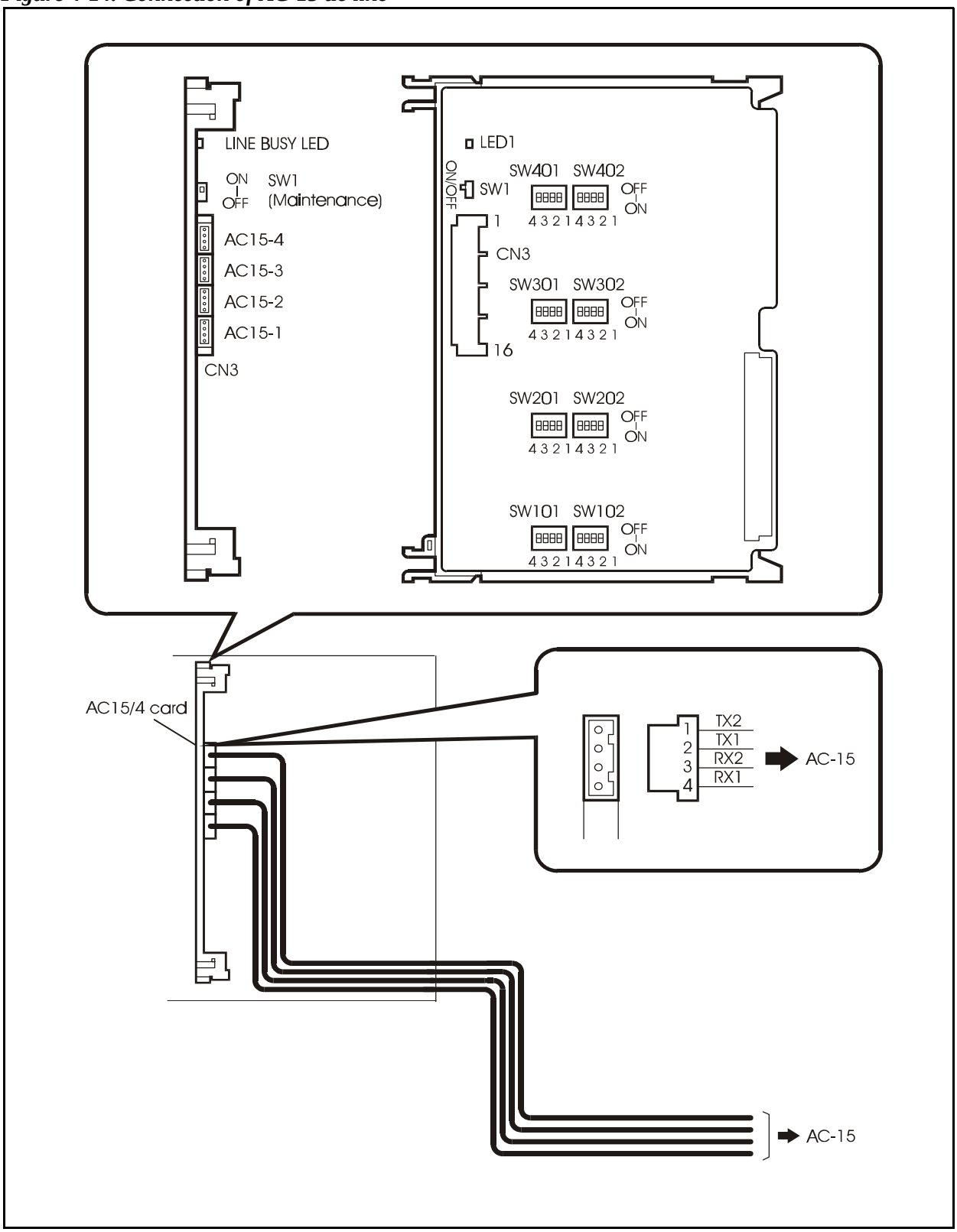
<table>
<tr><th>Switch No.</th><th>Setting</th></tr>
<tr><td>SW101,
SW201,
SW301,
SW401</td><td>For incoming calls loss plan
<table>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>Loss plan with in card</th><th>Remarks</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>+1dB</td><td>Initial value</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>-1dB</td><td></td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>-3dB</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>-5dB</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>-7dB</td><td></td></tr>
</table>
Note: Gain is obtained in a card only for the amount of wiring loss.</td></tr>
<tr><td>SW102,
SW202,
SW302,
SW402</td><td>For outgoing calls loss plan
<table>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>Loss plan with in card</th><th>Remarks</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>+4dB</td><td>Initial value</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>+2dB</td><td></td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>0dB</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>-2dB</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>-4dB</td><td></td></tr>
</table>
Note: Gain is obtained in a card only for the amount of wiring loss.</td></tr>
</table>

2. Install the AC15/4 card in any available flexible slot.
3. Attach the DDK connector to the AC-15 tie line.
4. Connect the AC-15 tie line with the DDK connector attached through the wiring aperture in the CCU to the DDK connector of the AC15/4 card (CN3 connector).

Table 4-22. LED indications of AC15 card

LED indication	Description
LED1 (LINE BUSY)	Turns ON when AC-15 card is in use. Turns ON when at least 1 of 4 circuits is in use.

Figure 4-14. Connection of AC-15 tie line



Extensions

The following cards are used with extensions:

- **DEC/8 VB-44610UK:** Digital key phone interface card (8 ports)
- **DEC/16 VB-44612UK:** Digital key phone interface card (16 ports)
- **DEC/24 VB-44613UK:** Digital key phone interface card (24 ports)
- **APEC/8 VB-44660UK:** SBS/A series key telephone interface card (8 ports)
- **AEC/8 VB-44620UK:** Standard telephone (SLT) extension interface card (8 ports)
- **SAEC/4 VB-44621UK:** Standard telephone (SLT) extension interface card (4 ports) (special slot).
- **SAEC/8 VB-44622UK:** Standard telephone (SLT) extension interface card (8 ports) (special slot).
- **SBRI/4 VB-44630:** S-point ISDN basic interface card (4 ports)
- **PRI/30 VB-44540UK:** T-point and S-point ISDN primary rate interface card (1 port/30 channels)

Install the correct type of cards in the cabinet for the extensions that are to be connected, then connect the extensions.

The following describes how to connect the respective types of extensions.

Digital Extension Cards

DEC/8/16/24

(VB-44610UK/VB-44612UK/VB-44613UK)

Guidelines

- Digital extensions are connected to a DEC card installed in a flexible slot of the CCU. A maximum of 8/16/24 extensions can be connected to each DEC/8/16/24 card respectively.
- Connect digital extension wires to digital key phones via secondary sockets (LJU).
- Locate digital key phones within 240m wiring distance from the CCU. The maximum loop circuit resistance is 40 ohms.
- DEC/8/16/24 cards can be removed and replaced while the system is operating. We recommend however before removing any cards that you pre-worn the users.
- The following table shows the maximum numbers of cards and extensions per system type.

The DEC/8 DEC/16 DEC/24 card is an interface for digital key telephones (1B+D: 64 kbps + 16 kbps).

The DEC/8 DEC/16 DEC/24 card is mounted in a flexible slot to connect digital extension line terminals (1B+D: digital multi-function telephones and DSSs).
The DEC/16 card accommodates a 16-circuit extension port interface.
The DEC/24 card accommodates a 24-circuit extension port interface.
The connection format is 2-wire nonpolarised star wiring.

The major specifications are as follows:

- Supply voltage and current to telephone terminal: maximum +24V/200mA
- Allowable wiring distance: maximum 240m
- Maximum loop resistance is 40 ohms to EM/24 and key handsets; maximum 20 ohms with loop to DSS/72 and Voice Recognition Telephone.

Figure 4-15. DEC/8DEC/16DEC/24 card

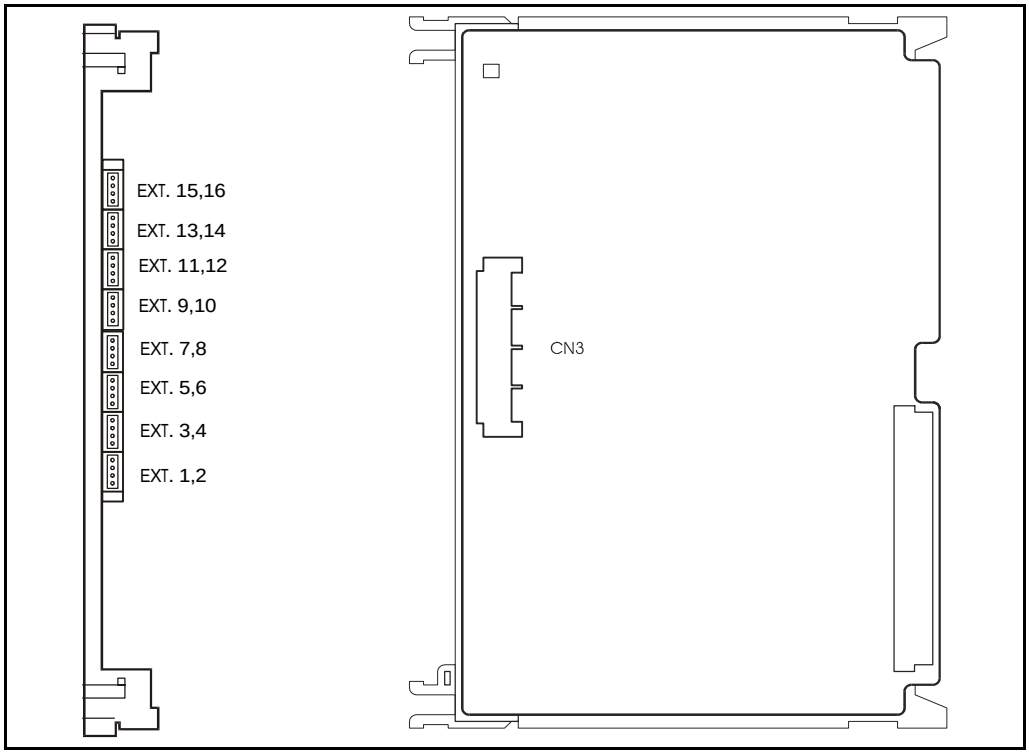


Table 4-23. Maximum cards and digital (and analog) extensions per system

System Type	DEC8	DEC16	DE24	Total
78 ports (CPC-HS)	2	0	0	16
132 ports (CPC-HM)	5	32(2)	48(2)	48

- The following table shows the pinout of the DDK connector (CN4) on the DEC/8 card.

Table 4-24. Pinout of DDK connector (CN3) on DEC/8 card

CN No.	Line No. (DDK No.)		Pin No.	Extension port	Signal
CN3	4	1	1	8	B
		2	2		A
		3	3	7	B
		4	4		A
	3	1	5	6	B
		2	6		A
		3	7	5	B
		4	8		A
	2	1	9	4	B
		2	10		A
		3	11	3	B
		4	12		A
	1	1	13	2	B
		2	14		A
		3	15	1	B
		4	16		A

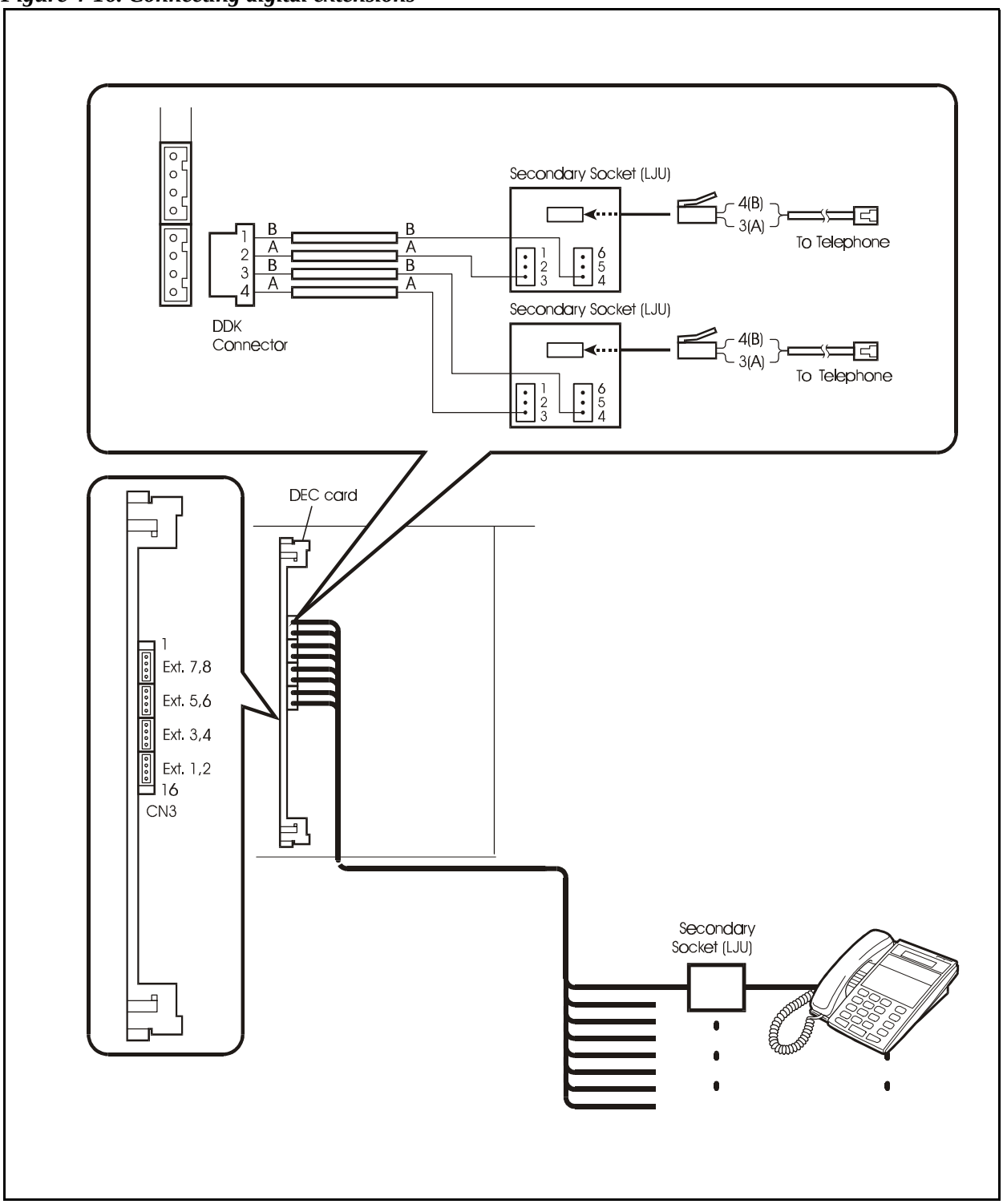
- If you are installing a DSS or EM24, connect them to a digital extension card.

Installation

1. Install the DEC/8/16/24 card in any available flexible slot.
2. Connect one DDK connector per two extension wire pairs.
3. Pass the extension wires with the DDK connectors through the wiring slot in the CCU and connect them to the DDK connector on the DEC/8/16/24 card.
4. Connect internal lines “B” and “A” to “pin 4” and “pin3” of the secondary socket (LJU).
5. Use the supplied extension cord to connect the digital key phone to the secondary socket (LJU).

Connecting Digital Key Telephones

Figure 4-16. Connecting digital extensions



Analog Proprietary Extension card

APEC/8

SBS/A-series Proprietary Extension card APEC card (VB-44660UK)

The APEC/8 card is an interface card for SBS or VB-9 / A-series proprietary key telephones. A maximum of 8 extensions can be connected to each APEC/8 card.

The APEC/8 card is mounted in a flexible slot. This card accommodates 8-extensions. The connection is 4-wires to each extension.

The major specifications are as follows:

- Supply voltage and current to telephone terminal: maximum +24V/150mA
- Allowable wiring distance: 240m
- Maximum Impedance: 40 ohms for key telephones.

For details on connections, see page 4-19.

Installation Guidelines

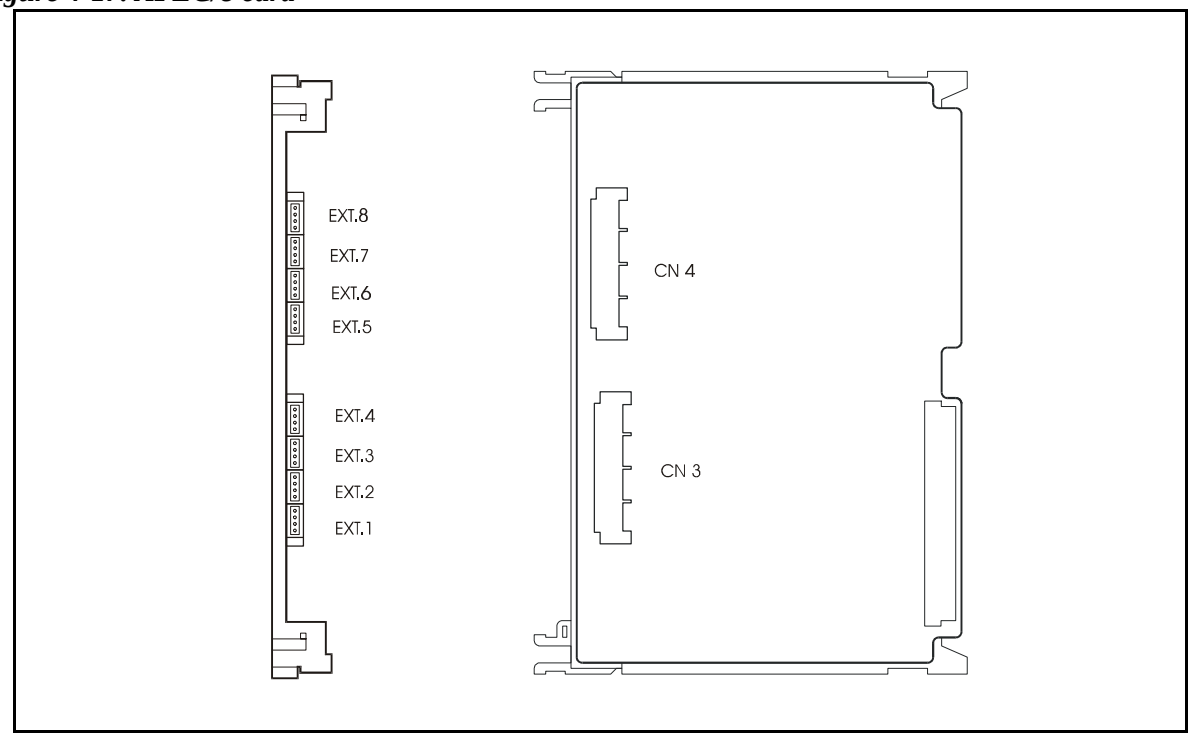
- **DISA Unit or DSS Console for SBS series, DSS Console or Digital Memory Unit for A-series are not available to connect this interface card.**
- Connect extension wires to key phones via secondary sockets (LJU).
- Locate key phones within 240m from the CCU. The maximum loop circuit resistance is 40 ohms.
- APEC/8 cards can be removed and replaced while the system is operating. DEC/8/16/24 cards can be removed and replaced while the system is operating. We recommend however before removing any cards that you pre-worn the users.
- Table 4-12 shows the maximum numbers of cards and extensions per system type.
- If AC15 line is installed, don't set Network Flash Send via "I-Use" Trunk key (FF1001-0027) to "1=Send Network Flash". Otherwise Normal Flash cannot be sent from A-series key telephone.

Table 4-25. Maximum Cards and analog extension s per system.

System Type	Maximum No. of Cards	Maximum number of extensions
78 ports (CPC-HS)	2	16
132 ports (CPC-HM)	5	40

- The following table shows the pinout of the DDK connector (CN3, CN4) on the APEC/8 card.

Figure 4-17. APEC/8 card

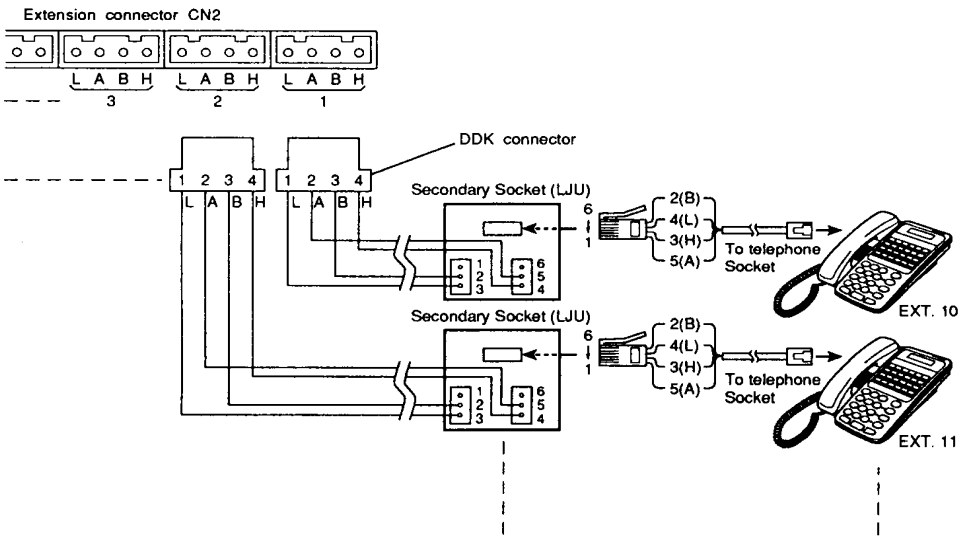


- If you are installing a DSS or EM24, connect them to the digital extension cards.

Installation

1. Install the analog extension card in any available flexible slot.
2. Connect one DDK connector per two extension wire pairs.
3. Pass the internal lines with the DDK connectors through the wiring slot in the CCU and connect them to the DDK connector on the APEC/8 card.
4. Connect extension wires “B (R)” and “A (T)” to “pin3” and “pin2”, “L ” and “H” to “pin1” and “pin4”of a secondary socket (LJU).

Figure 4-18. Connecting SBS/A-series



Necessary Programming

1. Free Slot Assignment
   FF01-(1-6)(01-12)Hold (1-99)Hold

Setting	Card type	Value
30	APEC/8	SBS/A series Interface card

2. Phone Type
   FF30-BSSC 00 (1) Hold
   1= Digital Key Phone, SLT, SBS, VB-9, or A series key phone

   Note: Step 1 and Step 2 will be set by S-ICX during Auto Configuration.

3. Flash Operation
   A series key phone doesn't have FL/R key. To send flash signal to Exchange line, press Exchange line/MCO key which is assigned on FF key and is in use status(light Green).
   A-series key phone has RECALL button. This button sends the same Flash signal as pressing Exchange line/MCO key during a talk.

   F30 BSSC 0429 Hold (1) Hold
   1=Send Flash to Exchange line

4. Digital Pad
   In case of SBS proprietary key telephone, use the same Digital Pad Class as ICX, DBS key telephone. (Class 3).
   Set each extension ports for A-series key telephone as Digital Pad Class 7.

F30 BSSC 08 Hold (7) Hold
7=Pad Class 7

5. FF key Assignment
   Depends on key phone, the maximum COs available to assign on FF keys are as follows;

	Phone	Max. Number	Phone	Max. Number	Phone	Max. Number
UK	VB-9211UK	6	VB-9211DSUK	6		
	VB-9411UK	12	VB-9411DSUK	12	VB-9411ADSUK	12

Note: In case of 6 FF key Telephone, assign Exchange line keys on FF1-FF6. Don't assign Exchange line keys on FF7-FF24.
If Exhcange line key is assigned on FF25-FF32, those Exchagne line keys become Non-appearance Exchange line key.
In case of 12 FF key Telephone, assign Exchange line keys on FF1-FF12. Don't assign Exchange line keys on FF13-FF24.
If Exhcange line key is assigned on FF25-FF32, those Exchagne line keys become Non-appearance Exchange line key.

6. Function key Assignment
   Function keys which are not equipped on A-series or SBS key telephone can be assigned to free FF keys if required. These are:

Function	Default for Feature Access Code
CONF key	*36
Program key	*38
Recall key	*39

Note: Recall key code(*39) must be entered from Programming Mode.

Note: System Programming is available from VB-9411ADS Alphanumeric telephone only.

Conditions

- Don't use 7segment type proprietary key telephone for ACD system.
- In case of 7segment type proprietary key telephone, when # key is pressed, ⊐ is displayed and when* key is presse⊏ is displayed on LCD.

- Alphanumeric Display phone

On Line	MM
CO	01

MM: Minute

- When the exchangeline conversation starts, [00] is displayed. One minute elapses, itcahnges to [01].
  At [59], it will return to [00].
- 7segment type prorietary key telephone displays CO call duration as follows;

MM

MM: Minute

- A-series key phone cannot use [Hot Dial Pad] feature.
- SBS key phone can use [Hot Dial Pad] feature.

Analog Extension cards

AEC/8

AEC card (VB-44620UK)

Special Analog Extension cards

SAEC/8,SAEC/4⊗

SAEC/8 card (VB-44622UK)/ SAEC/4 card (VB-44621UK)

The AEC/8 card is an extension line interface unit for standard telephones (SLT). The AEC/8 card is mounted on a flexible slot to connect a standard telephone (SLT) to the system.

The AEC/8 card has an 8-circuit analog extension line interface, and provides such functions as call signals from a standard SLT, detection of dialing (10 pps/DTMF), and speech.

The SAEC/8 card has a 8-circuit analog extension line interface, and provides the same function as AEC/8. This card has the special ribbon cable to connect to IS2 slot. This card cannot be installed into Flexible Slot 1-5. SAEC/4 has four circuits.

The supply voltage to a standard SLT is +24V; a ringer circuit is built-in.

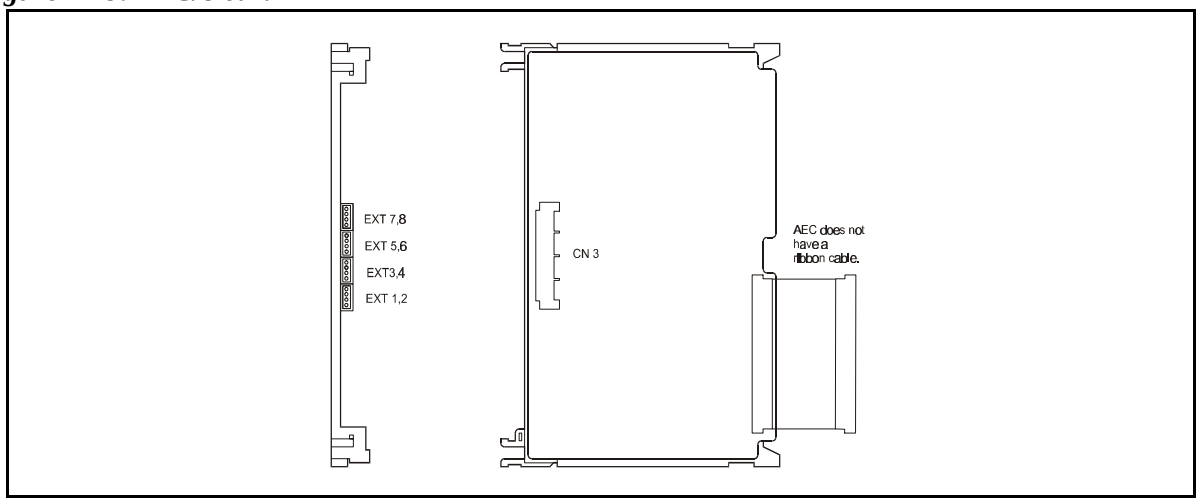
The duration of one call-up signal from the built-in ringer circuit is a maximum one second. Control is in three phases when eight exchange lines are simultaneously called up: the first phase for the first to third circuits, the second phase for the fourth to sixth circuit, and the third phase for the seventh and eighth circuits.

The major specifications are as follows:

- Supply voltage/current for speech path: +24 V/25mA or more
- Loop resistance: 100 Ohms or less
- Ringer signal frequency: 25Hz rectangular wave
- REN: 2
- CPC (Positive AEC Disconnect) control possible

- Ring trip detection possible

Figure 4-19. AEC/8 card



Installation Guidelines

- Analog extensions are connected to an AEC/8 card installed in a flexible slot of the main unit, or SAEC4/8 card installed in a IS2. A maximum of 8 internal lines can be connected to each AEC/8 or SAEC/8card, maximum of 4 internal lines can be connected to a SAEC/4 card.
- Connect analog internal lines to SLT via master sockets (LJU) or US Type secondary socket.
- Loop resistance:1.6km, Wire-Diameter 0.5mm, Telephone resistance 120 ohms.
- Four DTMF signal reception circuits are mounted on the CPC-HS or CPC-HM card. For this reason, the DTMF-telephone connection is possible. if more than the number of mounted circuits is required, add the MFR/8 card to the flexible slot.
- SAEC/4 or SAEC/8 cards cannot be removed and replaced while the system is operating.
- AEC/8 cards can be removed and replaced while the system is operating. However, because there are no busy lamps for extensions, you cannot check the status of these lines. We recommend using paging, etc., before removing the cards, to warn users that the lines will be disconnected.
- The pinout of the DDK connector on the AEC card is identical to that of the DEC/8 card.

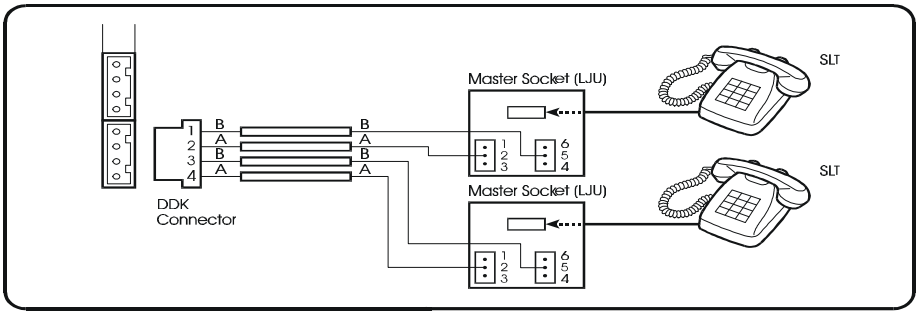
Maximum extensions available for each systems is as follows;

Table 4-26. Maximum Cards and analog extension s per system

System Type	Maximum digital extensions (8 initially installed)	Maximum SLTs (including SAEC/8)
78 ports (CPC-HS)	24	24
132 ports (CPC-HM)	56	48

Installation

Figure 4-20. Connecting analog extensions



1. Install the analog extension card in any available flexible slot.
2. Connect one DDK connector per two extension wires.
3. Pass the internal lines with the DDK connectors through the wiring slot in the CCU and connect them to the DDK connector on the AEC card.
4. Connect extension wires “B” and “A” to “pin5” and “pin2” of the master socket (LJU).
5. Use the two-conductor cable to connect the SLT to the master socket (LJU).

BRI cards (S-point)

S-point ISDN Basic Rate (VB-44630)

SBRI/4

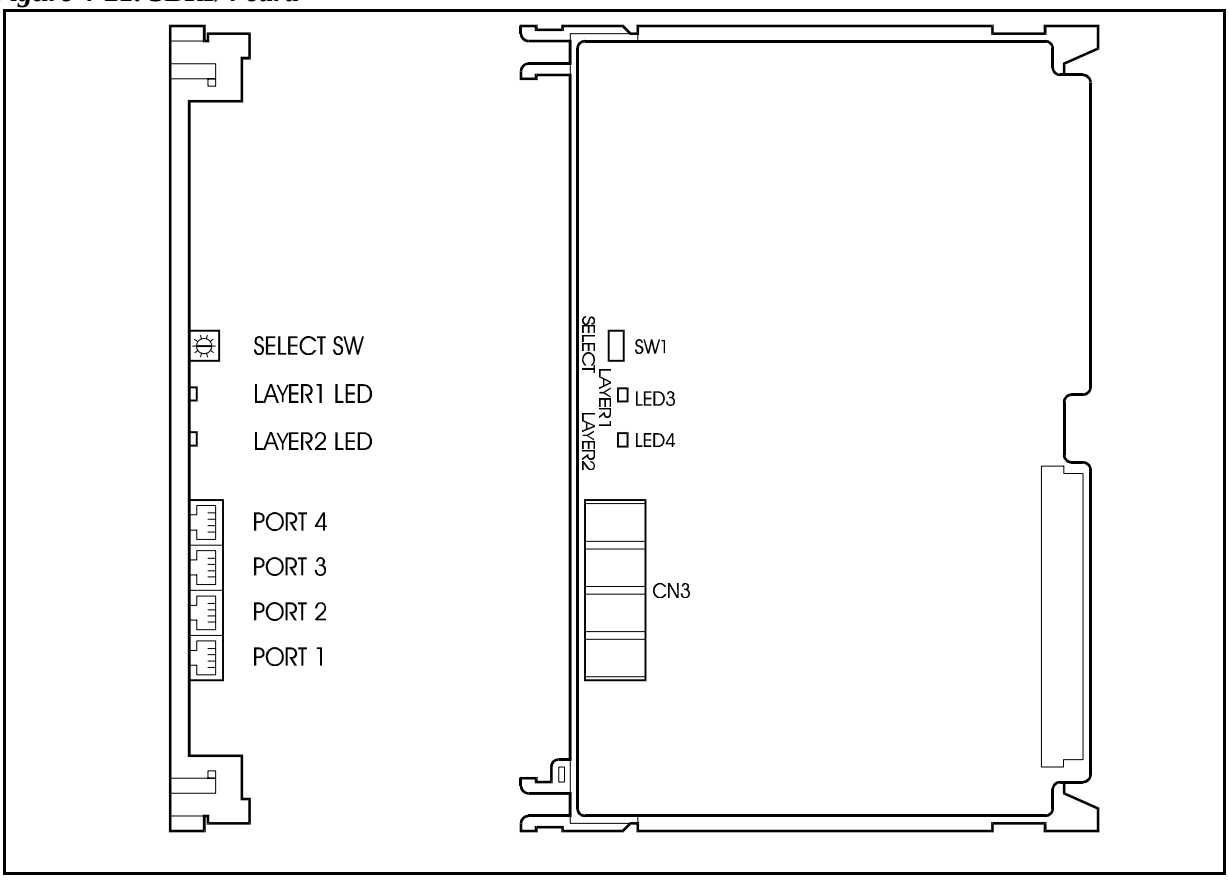
The SBRI/4 card is a basic interface (2B+D: 144 kbps) accommodating card for S-point IDSN.

The SBRI/4 card is mounted on a flexible slot to accommodate terminal extension lines of the basic user network interface of an ISDN terminal.

The system supplies +40V to the ISDN terminal which is mounted for extension lines.

The SBRI/4 card has an on-board 4-circuit S-point ISDN basic interface, and a lightning arrester.

Figure 4-21. SBRI/4 card



The following tables show switch settings and LED indications of the SBRI/4 card.

Table 4-27. Settings of circuit selection switch SBRI/4 card

Switch Position	LED Indication
0	OFF (default setting when unit is shipped)
1	1st interface condition displayed by LAYER1 LED and LAYER2 LED
2	2nd interface condition displayed by LAYER1 LED and LAYER2 LED
3	3rd interface condition displayed by LAYER1 LED and LAYER2 LED
4	4th interface condition displayed by LAYER1 LED and LAYER2 LED
5 to 0	Not available

Table 4-28. LED indications SBRI/4 card

LED indication	Description
LED3 (LAYER1)	Turns ON when synchronization is established
LED4 (LAYER2)	Turns ON when DL (Data Link) is established

Guidelines

- S-point ISDN is accommodated by the SBRI/4 card, which is installed in the flexible slot. Four S-point ISDN lines can be connected to each SBRI/4 card.
- S-point ISDN is connected to the SBRI/4 card using 8-conductor modular connectors. See Figure 4-22 on page 4-36 for the pin configuration of the 8-conductor modular connectors (RJ45).
- Setting the rotary switch SW1 of the SBRI/4 enables you to display the status of the selected circuits using the LED. Set it the same way you would set the TBRI/4 card. See Table on page 4-14 for details.
- The SBRI/4 card can be attached or detached when the power is turned ON. Confirmation during the extension conversation is not possible. Therefore, announcements made using paging need to be made when attaching or detaching. See page 4-2 for details.
- The system supplies -40V to the ISDN terminal, which is connected to the S-Point Interface card. Although output is limited so that the terminals which operate upon “Restricted Mode” (420mw) are available to operate by this power supply.
- The table below shows the maximum number of cards that can be installed in each system size.

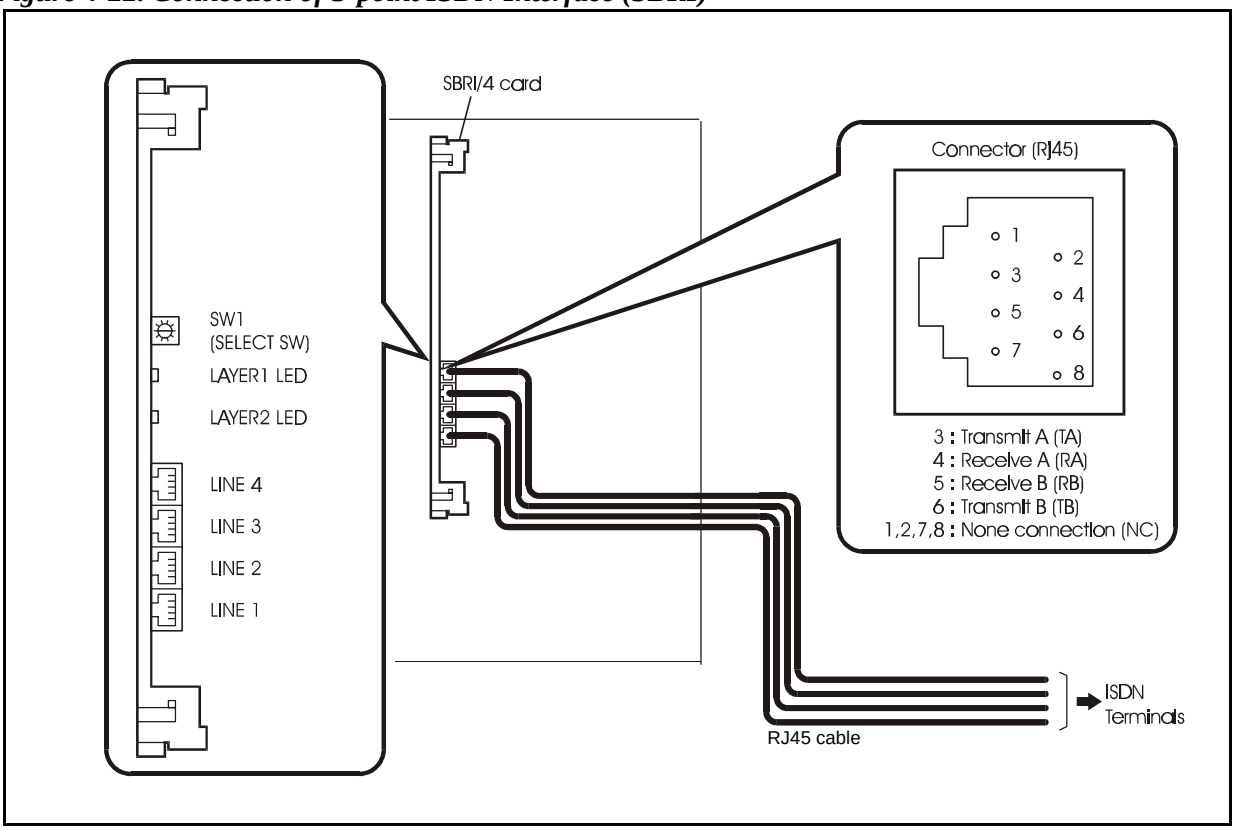
Table 4-29. Maximum Number of S-point ISDN Interfaces per system

System Type	Maximum Cards	Maximum Lines (No. of channels)
78 ports (CPC-HS)	5	20/40
132 ports (CPC-HM)	5	20/40

Installation

1. Insert the SBRI/4 card in an available flexible slot.
2. Connect the 8-conductor modular jack to the S-point ISDN wires from the ISDN terminal equipment.
3. Pass the S-point ISDN wires with 8-conductor modular jack through the wiring aperture in the cabinet and connect it to the modular connector on the SBRI/4 card.

Figure 4-22. Connection of S-point ISDN Interface (SBRI)



Point to Multi-Point Connection

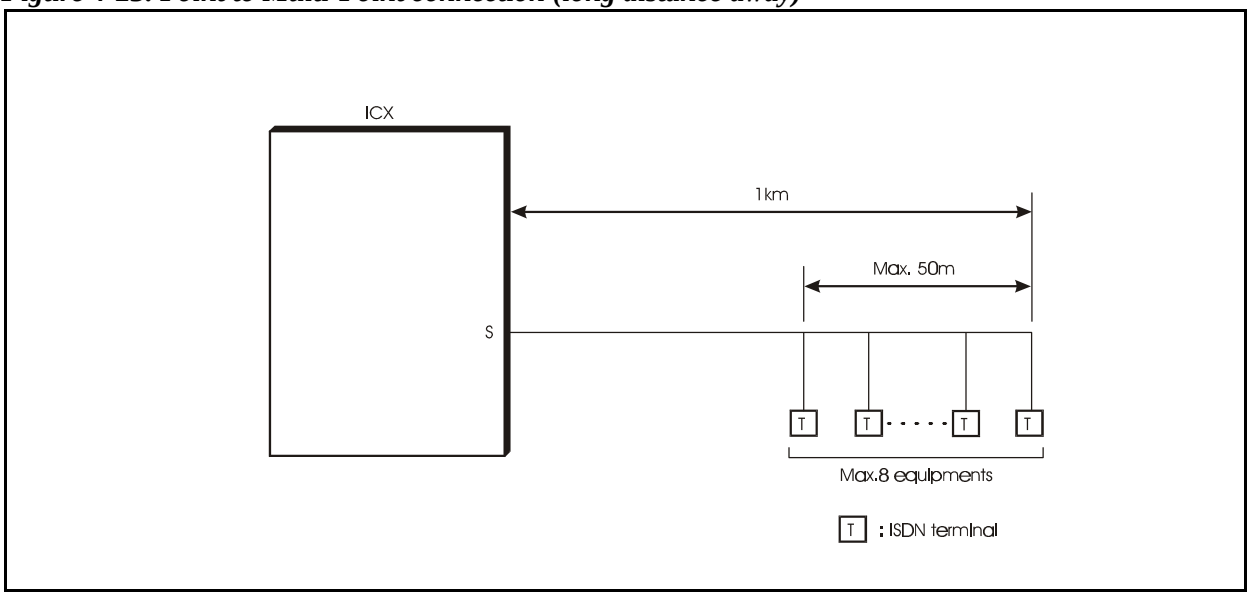
Point to Multi-Point connection is available in S-point BRI.

If you use Point to Multi-Point connection, wiring length limitation is different depending on the program setting. (Passive Bus: FF3 1 BSSC 0202)

Table 4-30. Point to Multi-Point wiring length limitations

FF3 1 BSSC 02 02 Hold (0 or 1) Hold	Wire	Distance
0: Short distance away	High Impedance wire (Zo = 150 ohms)	Max. = 200 m.
	Low Impedance wire (Zo = 75 ohms)	Max. = 100 m
1: Long distance away	Maximum = 1 km. The distance between terminal equipments must be connected within 25-50 m in order to restrict delay of the signal.	

Figure 4-23. Point to Multi-Point connection (long distance away)



S-Point ISDN Primary Rate Interface card

PRI/30

PRI/30 card (VB-44540UK)

Guidelines

- The T-point ISDN primary rate interface carrier line is accommodated on the PRI/30 card which is installed in the flexible slot. You can connect one T-point ISDN primary rate interface carrier to each PRI/30 card.
- By setting the switch and reprogramming, the PRI/30 card can also be set up as an S-point ISDN primary rate interface.
- The T-point ISDN primary rate interface carrier line connects to the switched network via a CSU.
- Depending on Dip switch SW2-2, the PRI/30 card can be set for "8-channel mode" or "Other mode". When set for "Other mode" you can also specify three channel classifications: "1 to 16B+D" or "1 to 30B+D".
- Table 4-11 shows the mode settings of the PRI/30 card.

Table 4-31. Mode Settings of PRI/30 card

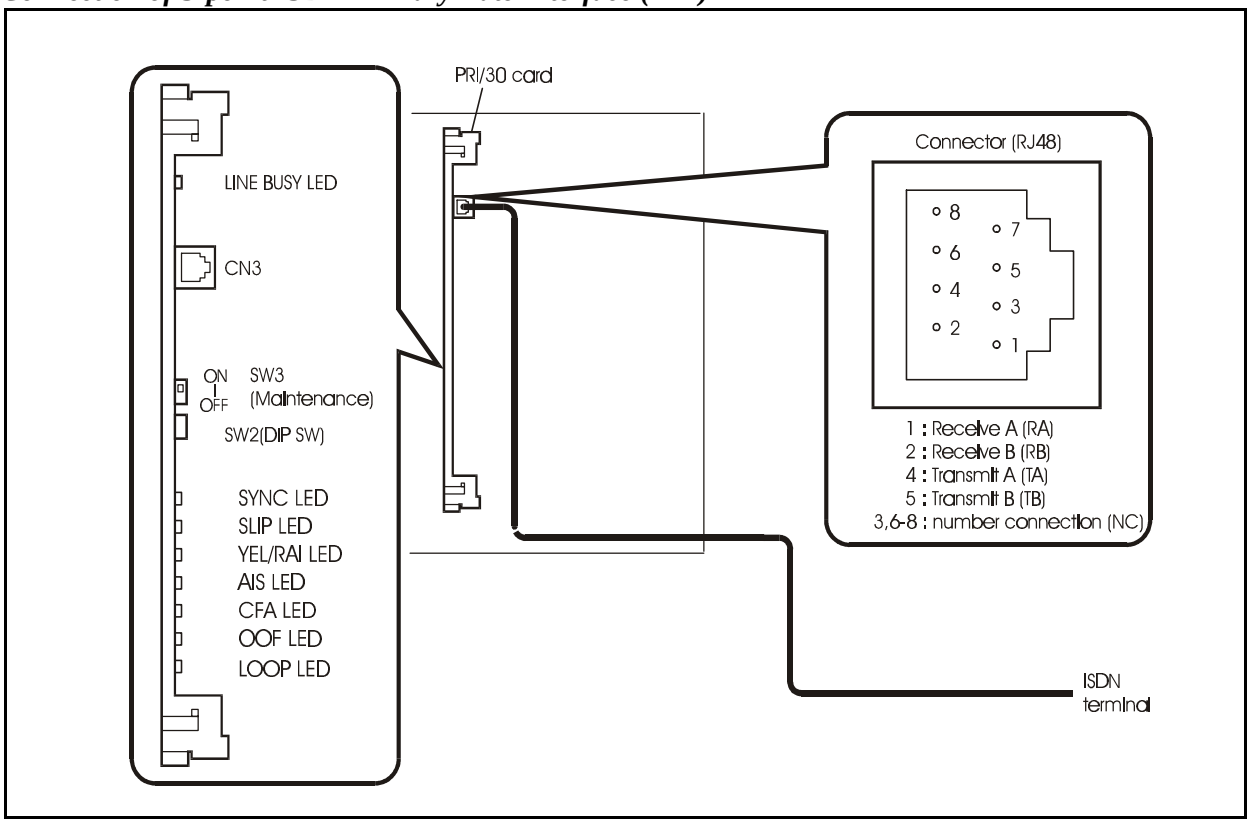
Card Name	Switch Setting Mode	Card Assignment/ No. of Channels Used
PRI/30 card (Primary Rate Interface)	8ch mode	PRIT/8: 1 to 8B+D
	Other mode	PRIT/16: 1 to 16B+D
		PRIT/30: 1 to 30B+D

- The S-ICX can accommodate a maximum of 8 communication channels per flexible slot. If you set the number of channels to nine or more, there is a limit on the number of cards that can be installed in the other slots. (See Table 4-12 for details.)
- The T-point ISDN primary rate interface carrier line uses an 8-conductor modular connector, and is connected to the PRI/30 card. See Figure 4-5 on page 4-12 for the pin configuration of the 8-conductor modular connectors.
- The PRI/30 card can be attached or detached when the power is turned ON by setting the maintenance switch (SW3). See page 4-2 for details.
- When installing a T-point ISDN primary rate interface, install the synchronization package on the CPC-HS or CPC-HM card.
- The CPC-HS or CPC-HM card cannot be inserted or removed when the power is turned ON . Always turn the power OFF when inserting or removing.
- The following table shows the maximum number of T-point ISDN primary rate interfaces that can be installed in each system size.

Table 4-32. Maximum number of T-Point Primary Rate Interface cards per system

System Type	PRI card channel mode selection	Maximum cards
CPC-HS	PRI card 8ch Use	5
	PRI card other channel mode use (16/24/31)	1
CPC-HM	PRI card 8ch use	5
	PRI card other channel mode use	2

Figure 4-24.
Connection of S-point ISDN Primary Rate Interface (PRI)



8 DTMF Receiver Card
MFR/8 card (VB-44110UK)

MFR/8

The MFR/8 card is a receiving circuit accommodating card for DTMF signals.

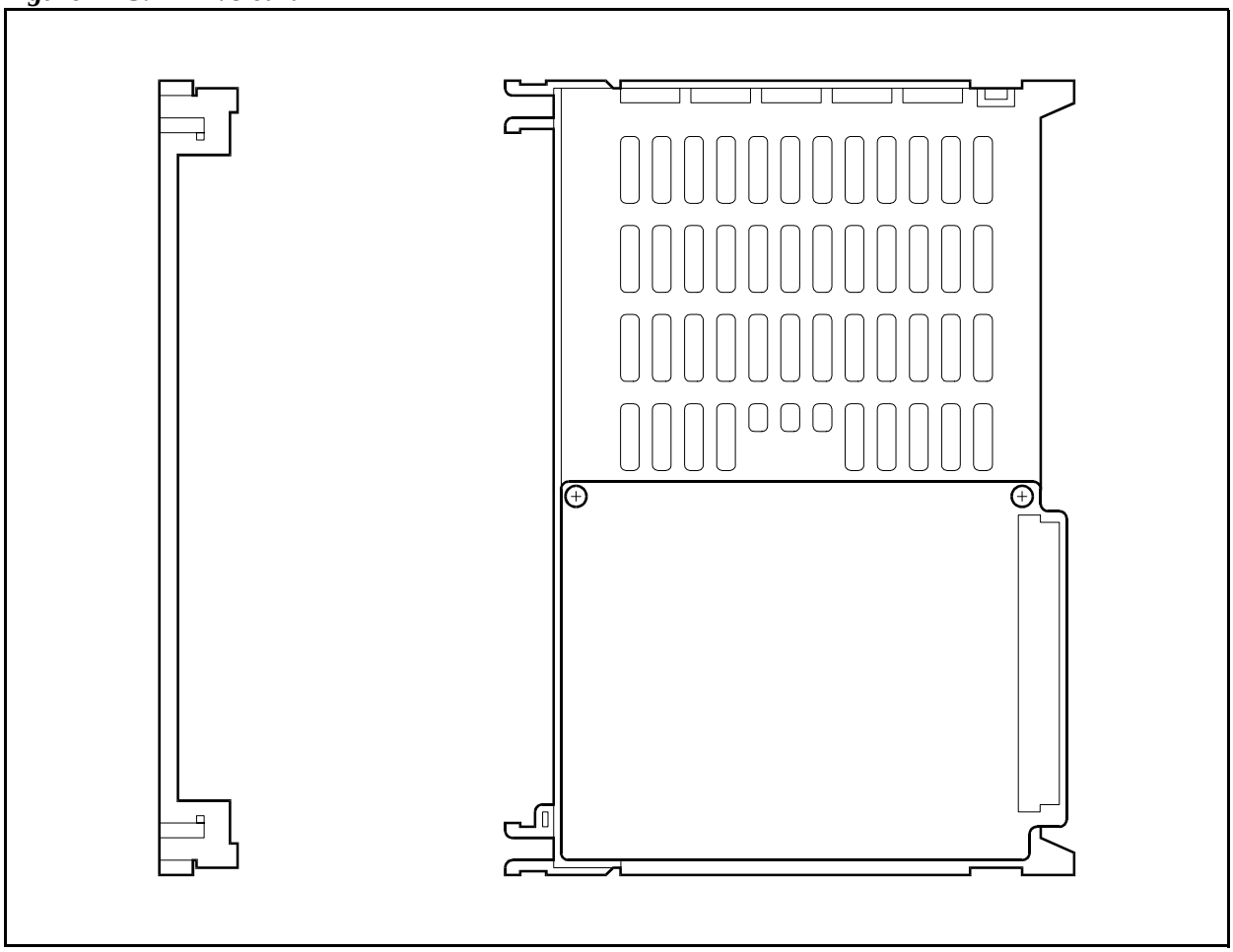
The MFR/8 card is mounted in an option slot or flexible slot to receive DTMF signals which are sent from a standard telephone (SLT) to an extension line. The MFR/8 card also can receive DTMF signals sent from an exchange line.

All MFR/8 cards can be mounted in the same cabinet. The following table shows the relationship between the number of system ports and the maximum number of DTMF cards.

Table 4-31. Maximum number of DTMF cards

Port Number	1 to 132 (1 cab.)
Max. number of cards	2

Figure 4-25. MFR/8 card



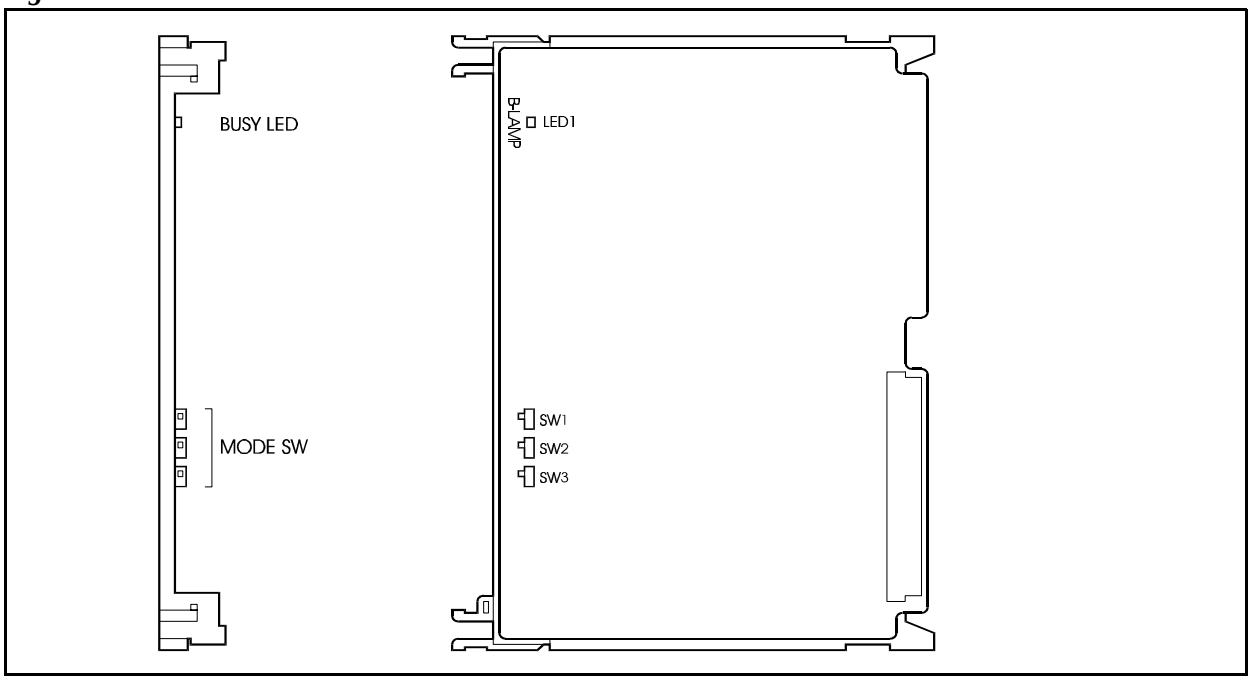
8-Party Conference Card
CONF card (VB-44120UK)

CONF

The CONF card is conference speech card. It is mounted in a flexible slot, and supports up to four 8-party conferences simultaneously.

Only one CONF card can be mounted into each cabinet. Slot limitations and restrictions apply; see pg. 3-14 for more information.

Figure 4-26. CONF card



The following table shows the required switch settings for the CONF card.

Table 4-33. CONF Card switch settings

SW1	SW2	SW3	Usage
OFF	OFF	OFF	one 8-party conference circuit available
OFF	ON	OFF	two 8-party conference circuits available
OFF	OFF	ON	three 8-party conference circuits available
OFF	ON	ON	four 8-party conference circuits available

NOTES:

Three-party conferences are controlled by the CPU card and do not require the CONF card.
Maximum eight simultaneous 3-party conferences can occur in a system.
An 8-party conference will use one of the 3-party conference circuits until a 4th party is added to the conference; then the 3-party circuit is released (available for other use).
Also, if the number of members drops below four during the conference, a 3-party conference circuit is reseized.

CONF card switch settings must match **Free Slot Assignment** in programming (address: **01 [1] [01-05] Hold [52-55] Hold**), or 8-party conferencing will not work.

ACD Card

ACD card (VB-44140UK)

The ACD card is an Automatic Call Distribution (ACD) card which is mounted in the CCU.

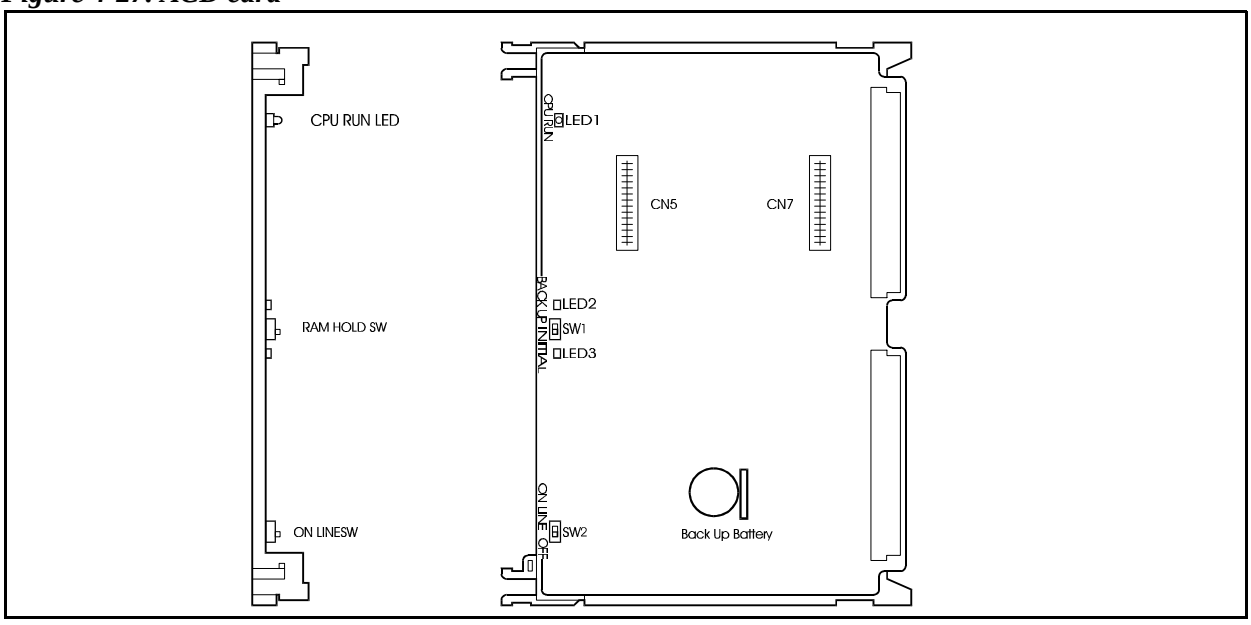
By using the ACD card with one VPU/4 card (VB-44160UK), simplified ACD functions such as the incoming call distributing function and processed call number information for each terminal can be supported.

MIS(Management Information System) reports can be sent (output through an RS-232C port) to either a printer or PC computer. This port is mounted in the ACD unit. This port requires a dedicated RS-232C cable.

Only one ACD card can be mounted in a system.

For more information on ACD card installation and the Built-In ACD option in general, see ***Section 520: Built-In ACD Reference***.

Figure 4-27. ACD card



The following tables show switch settings and LED indications of the ACD card.

Table 4-34. Switch settings of ACD card

Switch No.	Setting	Description
SW1	BACK UP	Set when retaining RAM data.
	INITIAL	Set when clearing RAM data.
SW2	ON LINE	Normal operation (set to ON LINE during regular operation)
	OFF LINE	Not used.

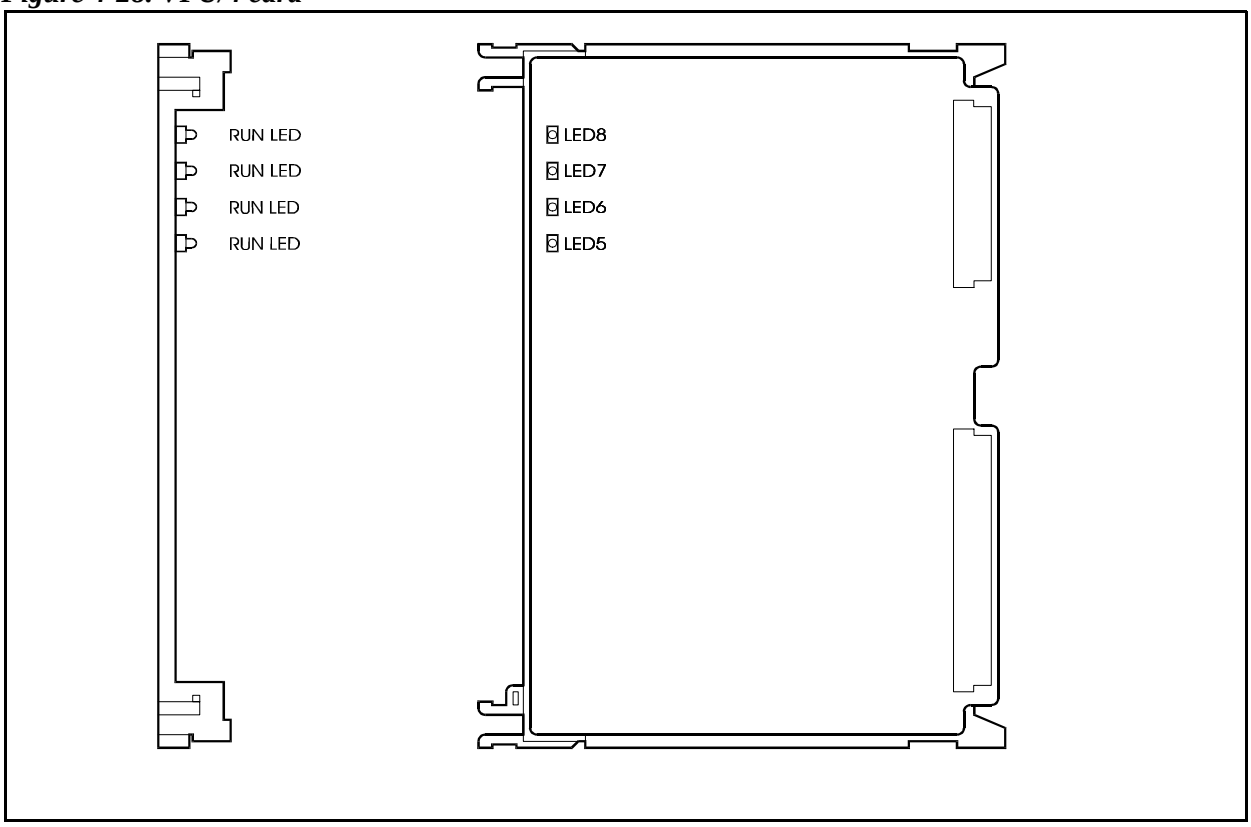
Table 4-35 LED indications of ACD card

LED indication	Description
LED1 (CPU RUN)	Blinks when the CPU is in operation.

4-port Voice Processing Card
VPU-4 card (VB-44140UK)

This card can be used as a voice processing card for ACD when combined with the ACD card (VB-44140UK). The VPU/4 card and ACD card (VB-44140) can be installed together in a cabinet to support ACD.

Figure 4-28. VPU/4 card



The following table describes LED indications.

Table 4-36. LED indications of VPU/4 card

LED indication	Description
LED1-LED4 (RUN)	Blinks when the CPU is in operation.

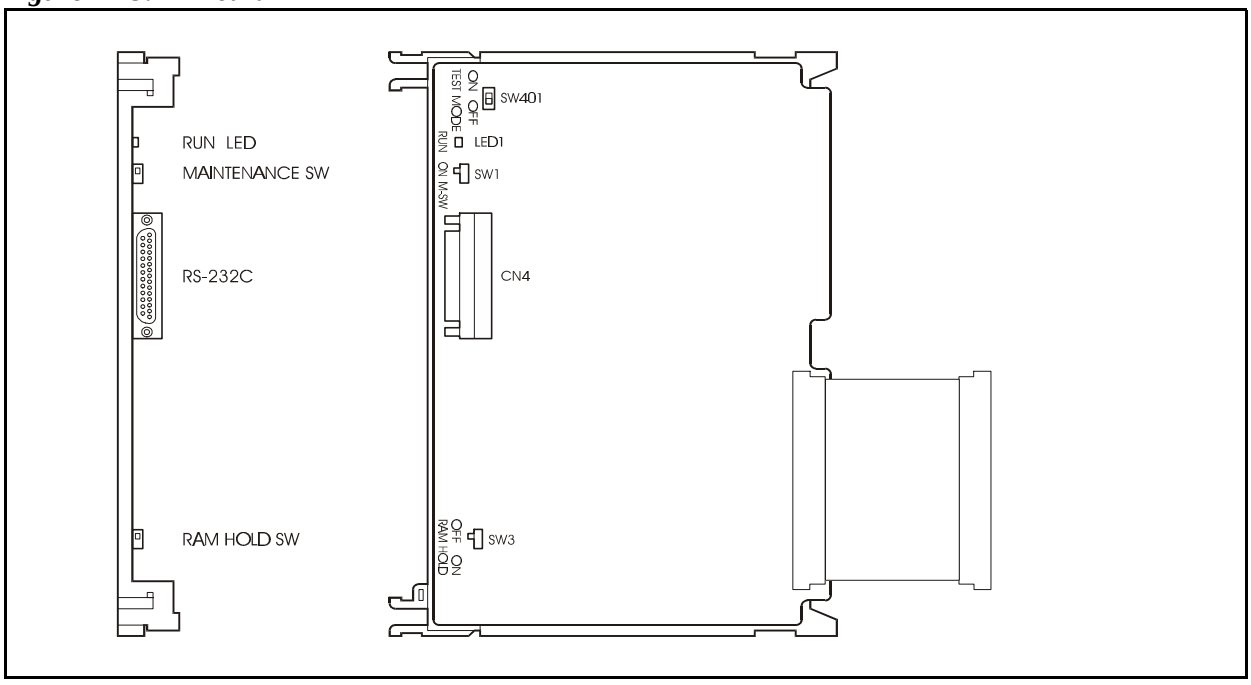
Special API Card
SAPI card (VB-44132)

The SAPI card is an interface card for 3rd-party applications such as enhanced voice mail, ACD, and CTAPI.

The external interface is an RS-232C port (maximum 19200 bps).

Only one SAPI card is mounted on the mother board with a special cable.

Figure 4-29. API card



The following tables show switch settings and LED indications of the API card.

Table 4-37. Maintenance switch (SW1) settings of API card

Setting	Description
ON (top)	Card is closed and can be mounted and removed when power is ON. (Sending/ receiving of calls is disabled. If this is set during speech, sending/receiving of calls is disabled after speech ends.)
OFF (bottom)	Normal operation. (This switch is set to OFF for normal operation.)

Table 4-38. Internal diagnosis switch (SW2) settings of API card

Setting	Description
ON (top)	Normal operation (This switch is set to ON for normal operation.)
OFF (bottom)	Normal operation (This switch is set to OFF for normal operation.)

Table 4-39 Memory backup switch (SW3) settings of API card

Setting	Description
ON (top)	Self-diagnosis API card
OFF (bottom)	Can delete memory data of API card.

Table 4-40. LED indications of API card

LED indication	Description
LED1 (RUN)	Flashes green when LPU is operating.

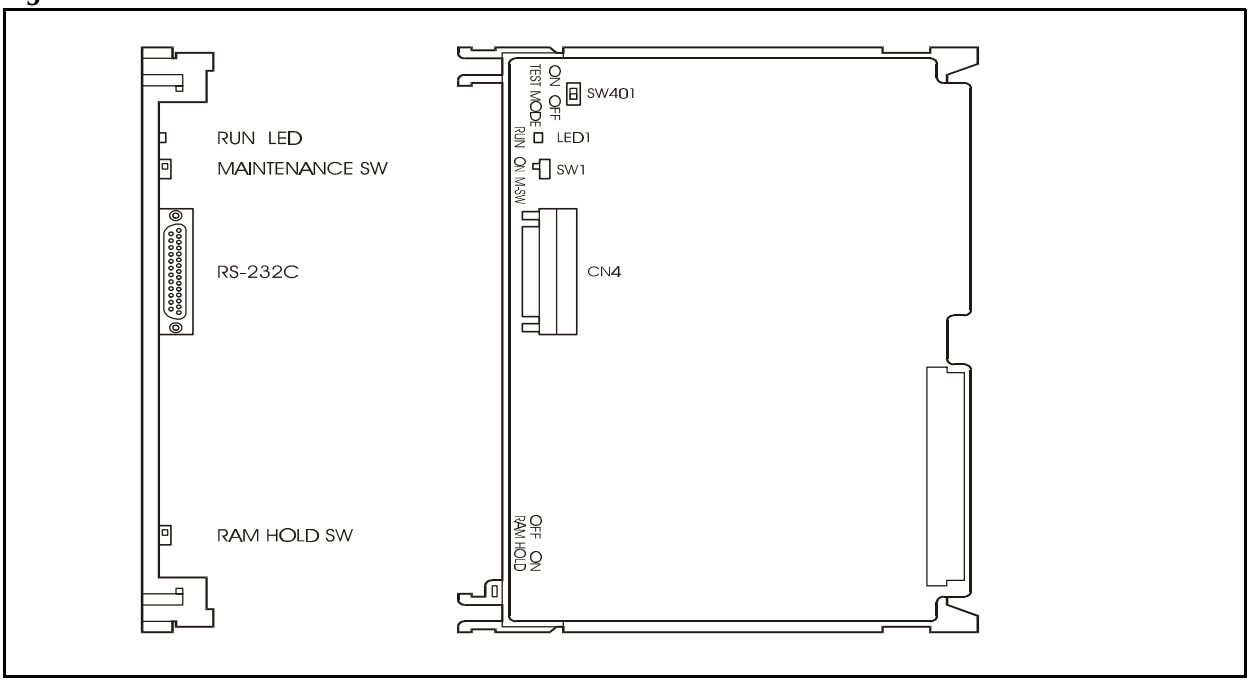
API Card
API card (VB-44131)

The API card is an interface card for applications such as voice mail and ACD.

The external interface is an RS-232C port (maximum 19200 bps).

Only one API card can be mounted for each system. This sheet is mounted to on option slot (OP1 or OP2) or on an expansion slot (FS1 to FS12).

Figure 4-30. API card



Maintenance switch (SW1) settings of API card

Setting	Description
ON (top)	Card is closed and can be mounted and removed when power is ON. (Sending/ receiving of calls is disabled. If this is set during speech, sending/receiving of calls is disabled after speech ends.)
OFF (bottom)	Normal operation (This switch is set to OFF for normal operation.)

Table 4-41. Internal diagnosis switch (SW2) settings of API card

Setting	Description
ON (top)	Normal operation (This switch is set to ON for normal operation.)
OFF (bottom)	Normal operation (This switch is set to OFF for normal operation.)

Table 4-42. LED indications of API card

LED indication	Description
LED1 (RUN)	Flashes green when LPU is operating.

Chapter 5. Peripheral Equipment

This chapter describes how to install and connect DSS consoles, doorphone adaptors, and other peripheral equipment. It also explains how to replace the CPC card's backup battery.

Note: The ⊗ symbol, appearing in this chapter next to a Card Name, indicates that the card must not be removed or inserted while the power is ON.

Music-On-Hold (MOH) *CPC-HS or CPC-HM card* ⊗

Guidelines

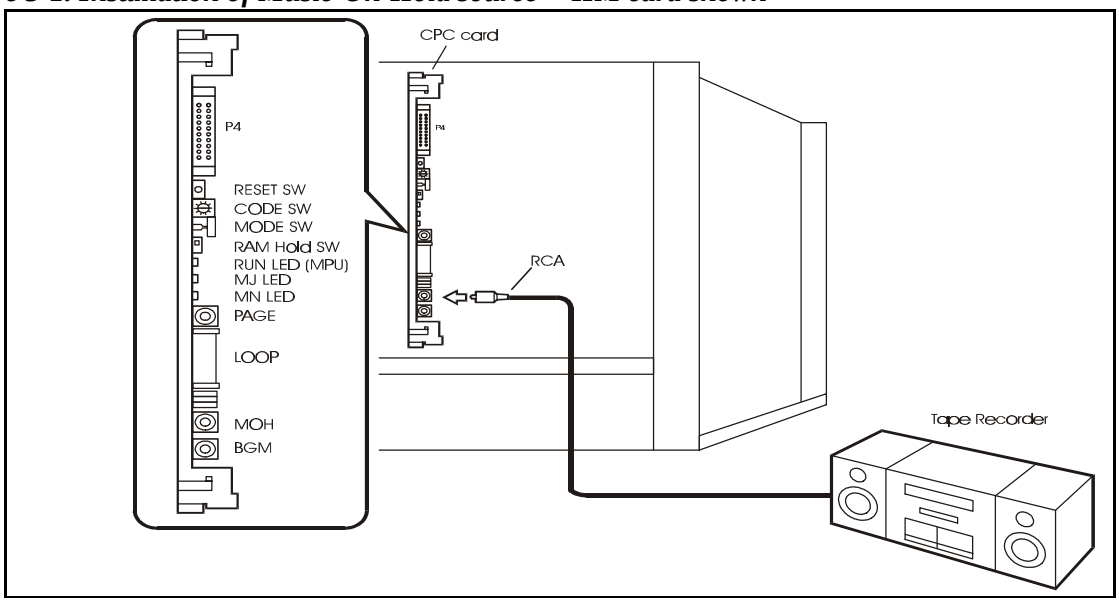
- To provide music-on-hold (MOH), a music source such as a CD player or tape recorder can be connected to the MOH input of a CPC-HS or CPC-HM card installed in the CPC slots of the CCU.
- CPC-HS and CPC-HM cards cannot be installed and removed while the CCU is operating. Turn the power off first.
- The maximum input impedance of the MOH input (CN4: RCA) is 10 kohms. The maximum input signal level is -10 dB.

Installation

1. Connect one end of an RCA pin cable (2-core shielded cable) to theCN4 (RCA) connector on the CPC-HS or CPC-HM card.
2. Connect the other end of the RCA pin cable to the output (AUX) of a music source such as a CD player or tape recorder.

Note: Fit the appropriate connector (RCA or mini-plug, etc.) as required to the end of the RCA pin cable to suit your music source.

Figure 5-1. Installation of Music-On-Hold source - -HM card shown



Background Music (BGM)

CPC-HS, CPC-HM

Guidelines

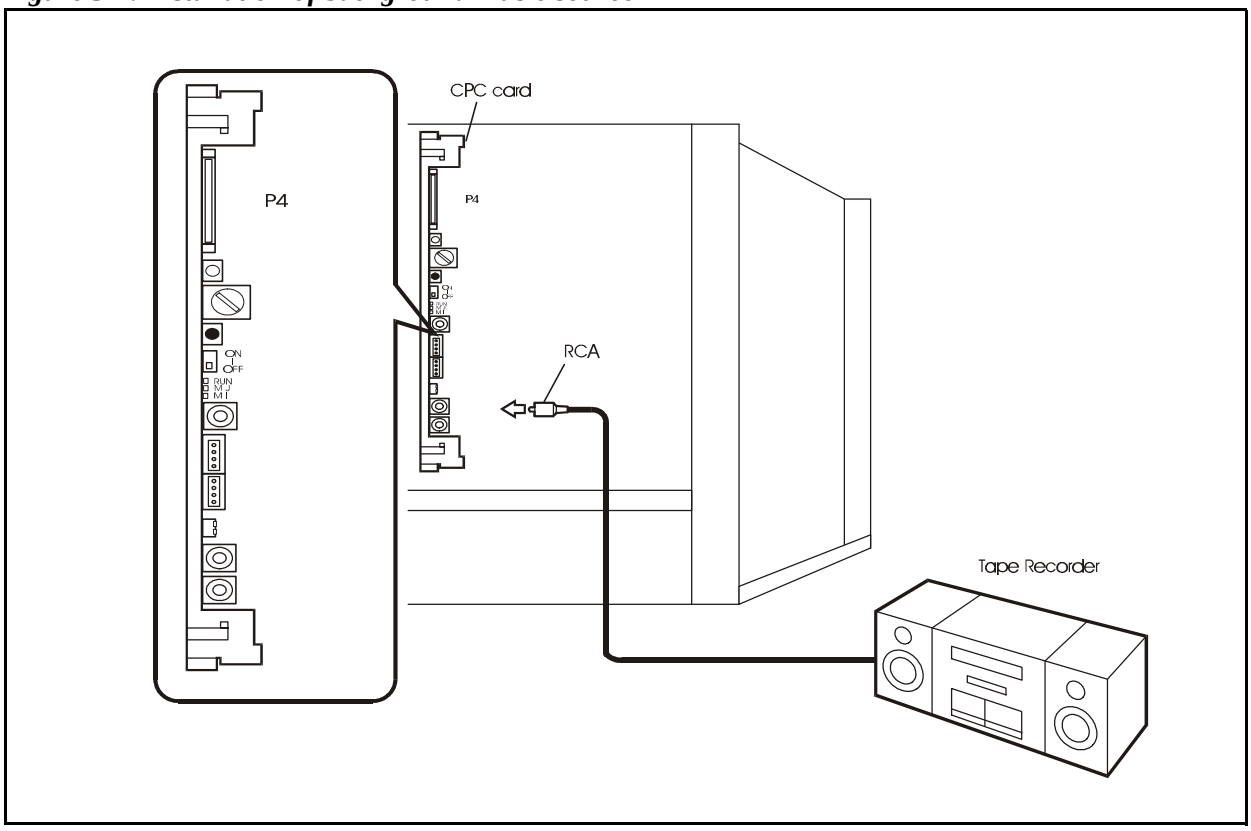
- CPC-HS has one music souce input for BGM and MOH.
- A music source such as a CD player or tape recorder can be connected to the BGM input (RCA) of a CPC card.
- The maximum input impedance of the BGM input (CN4: RCA) is 10 kohms. The maximum input signal level is -10 dB.

Installation

1. Connect one end of an RCA pin cable (2-core shielded cable) to the CN4 (RCA) connector on the CPC card.
2. Connect the other end of the RCA pin cable to the output (AUX) of a music source such as a CD player or tape recorder.

Note: Fit the appropriate connector (RCA or mini-plug, etc.), as required, to the end of the RCA pin cable to suit your music source.

Figure 5-2. Installation of background music source



Paging

CPC-HS, CPC-HM ⊗

⚠ **CAUTION:**
- Turn the power switch and the external breaker OFF, and disconnect the AC cable before installing the Paging equipment.

Guidelines

- Paging can be performed by connecting a paging amplifier, relays, and speakers to an CPC-HS or CPC-HM card.
- CPC-HS or CPC-HM cards cannot be installed and removed while the cabinet is operating. Turn the power off first.
- The paging amplifier, relays, and speakers are not provided with the S-ICX and must therefore be purchased separately.
- Table 5-1 shows the pinout of the external connector J3 (RCA Jack) of the CPC-HS or CPC-HM card. P1 to P5 of the mother board controls external paging equipment (pulse output). P5 pins 1 and 2 (loop) control the actual paging port. J3 (CPC-HS and CPC-HM) represent the actual paging port (for voice bus).

Table 5-1. External Page Connectors

Connector/Pin No.	Signal	Description	Location
P8-P05	P5	External paging control output 5 (withstand voltage: 30V)	Mother Board
P8-P04	P4	External paging control output 4 (withstand voltage: 30V)	Mother Board
P8-P03	P3	External paging control output 3 (withstand voltage: 30V)	Mother Board
P8-P02	P2	External paging control output 2 (withstand voltage: 30V)	Mother Board
P8-P01	P1	External paging control output 1 (withstand voltage: 30V)	Mother Board
P5-1 (loop)	MB	External paging control output B (relay loop make contact: maximum current: 2A)	CPC-HS, CPC-HM
P5-2 (loop)	MA	External paging control output A (relay loop common contact: maximum current: 2A)	CPC-HS, CPC-HM
J3	B	External paging I/O B RCA Jack	CPC-HS, CPC-HM

Installation

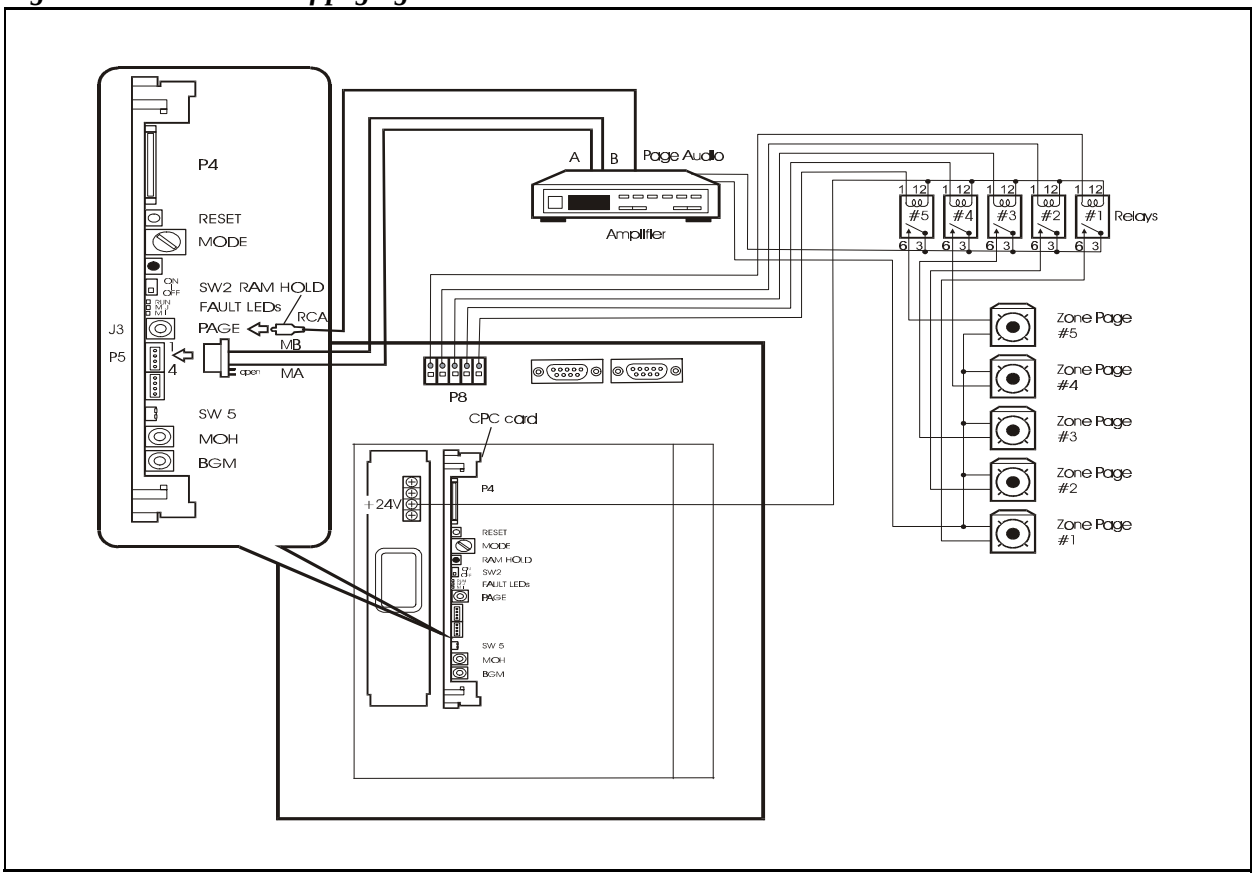
1. Set R351 on the CPC-HS and CPC-HM card to match the output impedance of the connected device. See Table 5-2 for settings.

Table 5-2. Settings of R351 on CPC-HS and CPC-HM card

	Position	Setting
R351	Initial	External paging device output impedance: 600 Ohms
	Cut	External paging device output impedance: high impedance (default when shipped)

2. Prepare a cable with a DDK connector and connect one end of it to P5 (loop) on CPC.
3. Connect the other end of the cable to the paging amplifier, relays, and speakers.
4. To install external paging:
   - Connect external paging loop control to P1-P5.
   - Connect dry contact leads for external paging to the mother board terminals, which include P8-P01, P8-P02, P8-P03, P8-P04, P8-P05. (See Table 5-1 on page 5-3 for additional information.)

Figure 5-3. Connection of paging device



PC Customization Tool

Guidelines

- A PC can be connected to the mother board to customize the setup without using a telephone for customization.
- If you are using a PC for customizing the setup, a Windows® 95/98/2000/NT (Not 3.x) -based computer is required.
- Prepare an RS-232C cable.
- To send data from a PC to the main unit, you will need the PC customization software, Windows®, and a 3.5-inch 2HD floppy disk (formatted for Windows®) for saving the customization data.
- Table 5-3 shows the pinout for the RS-232C port (CN5 and CN6) of the cabinet mother board.

Table 5-3. RS-232C port (P6 and P7) pinout of mother board

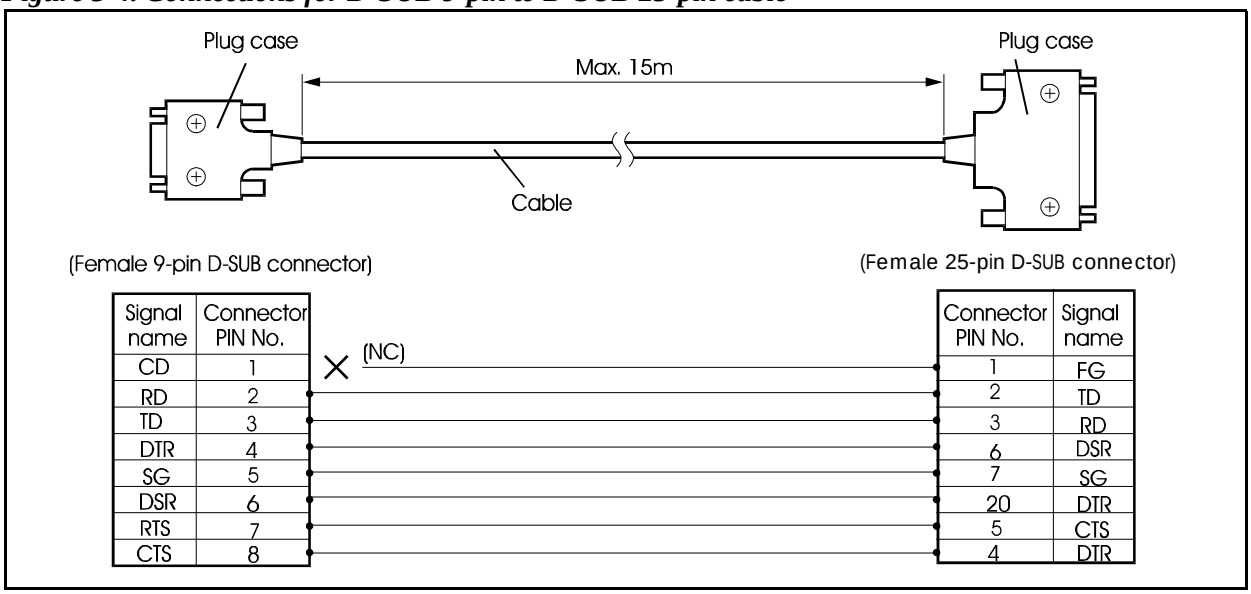
Connector Pin No.	Signal	IN/OUT	Description
1	CD	-	Not used
2	RD	IN	Receive data
3	TD	OUT	Send data
4	DTR	OUT	Ready signal from PBX
5	SG	-	Signal ground
6	DSR	IN	Data set ready
7	RTS	OUT	Request to send
8	CTS	IN	Clear to send
9	FG	-	Not used

Making an RS-232C Cable

Depending on the RS-232C connector on your PC, you will need to make one of the following RS-232C cables.

- **D-SUB 9-pin to D-SUB 25-pin:** If your PC is equipped with a 25-pin D-SUB RS-232C connector, make a cable as shown in Figure 5-4. The cable should be less than 15m long.

Figure 5-4. Connections for D-SUB 9-pin to D-SUB 25-pin cable

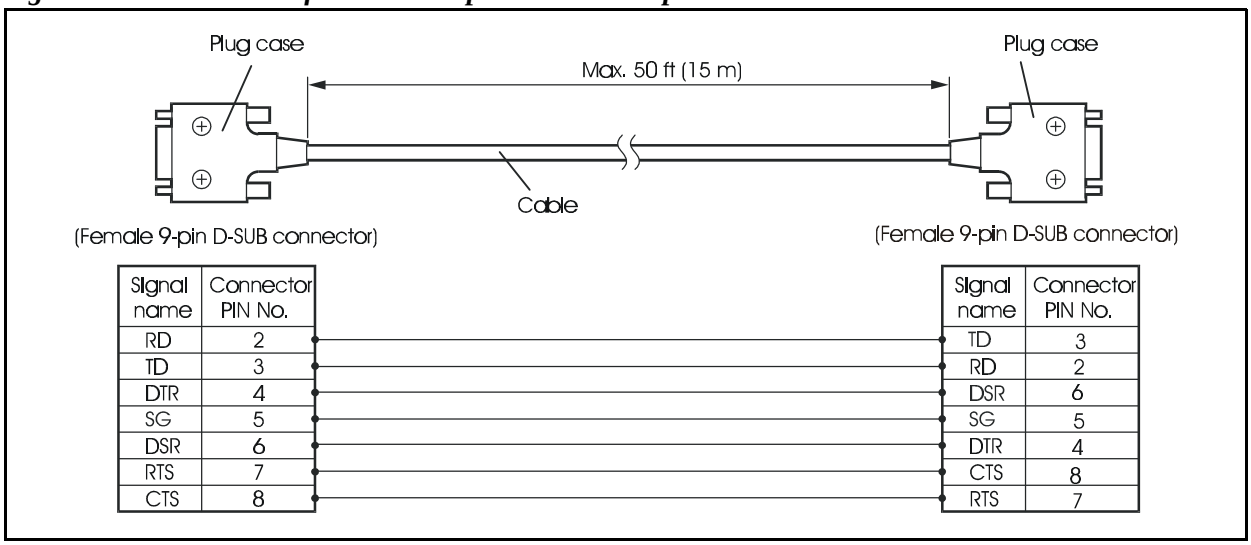


Signal name	Connector PIN No.
CD	1
RD	2
TD	3
DTR	4
SG	5
DSR	6
RTS	7
CTS	8

Connector PIN No.	Signal name
1	FG
2	TD
3	RD
6	DSR
7	SG
20	DTR
5	CTS
4	DTR

- **D-SUB 9-pin to D-SUB 9-pin:** If your PC is equipped with a 9-pin D-SUB RS-232C connector, make a cable as shown in Figure 5-5. The cable should be less than 15 m long.

Figure 5-5. Connections for D-SUB 9-pin to D-SUB 9-pin cable — Inter-Linc Cable

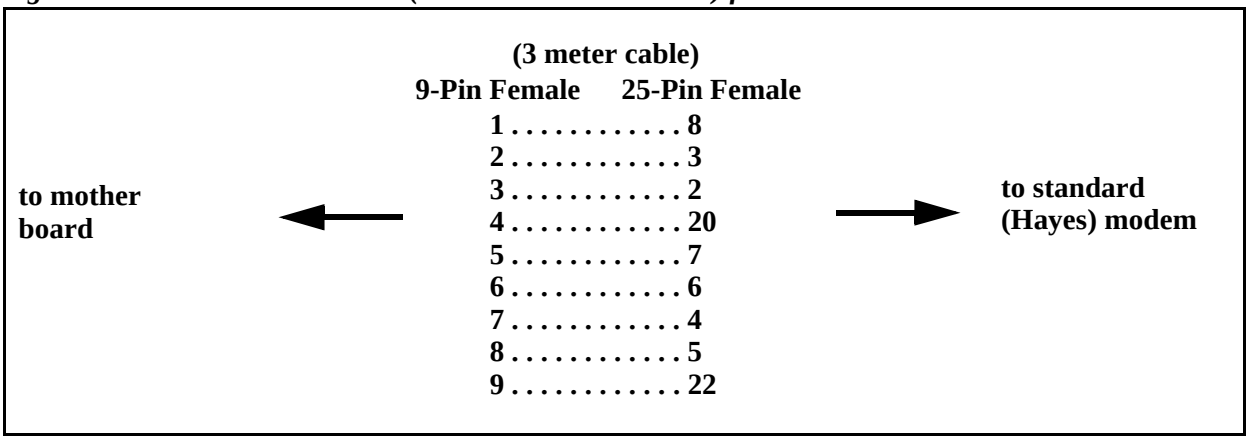


Signal name	Connector PIN No.
RD	2
TD	3
DTR	4
SG	5
DSR	6
RTS	7
CTS	8

Signal name	Connector PIN No.
TD	3
RD	2
DSR	6
SG	5
DTR	4
CTS	8
RTS	7

- **Remote Connection:** Use a standard (not null) modem cable for the connection between the mother board and modem.

Figure 5-6. Modem Cable Pinout (mother board-to-modem) for a remote connection

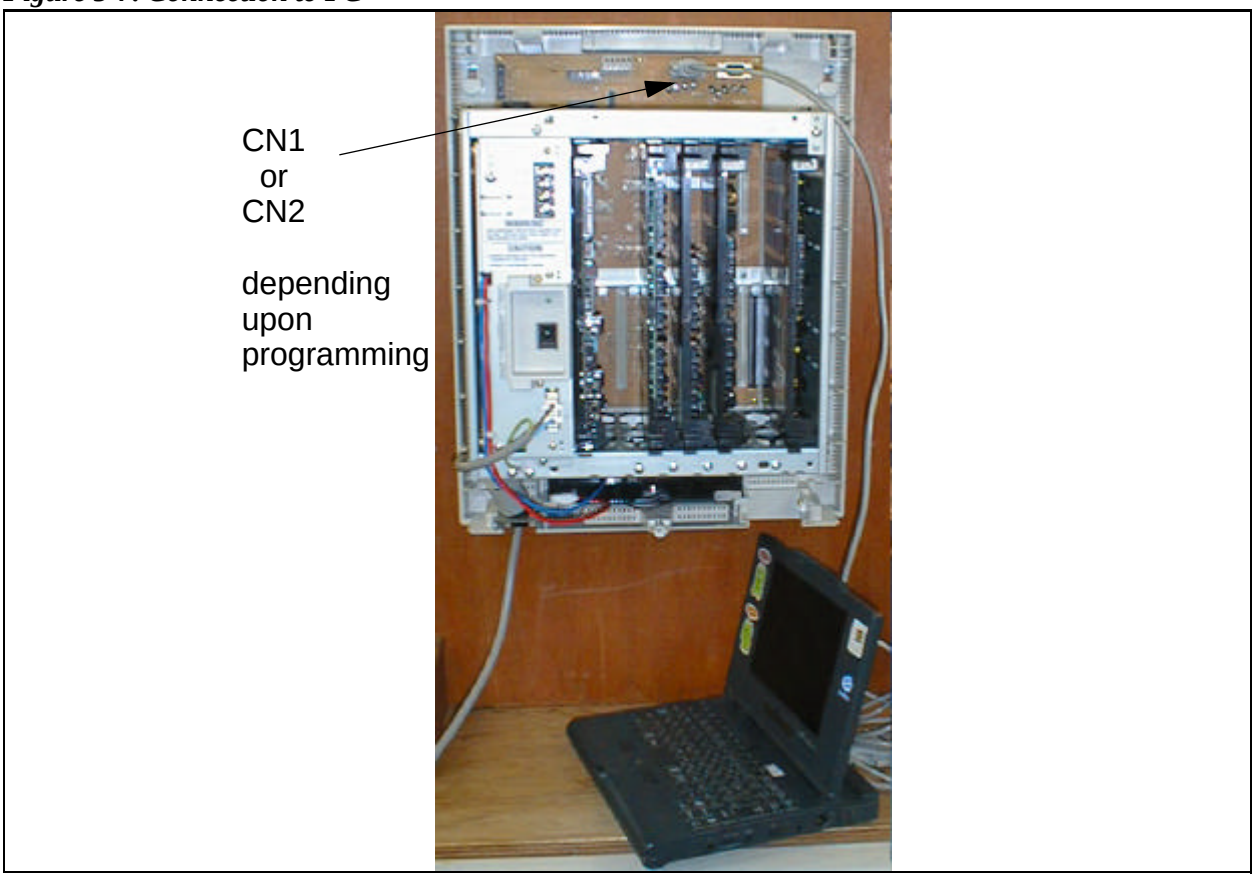


Installation

1. Connect the 9-pin D-SUB connector on the RS-232C cable to the P6 connector (port 1) on the mother board.

2. Pass the RS-232C cable through the wiring slot in the cabinet, then connect the 9-pin or 25-pin D-SUB connector on the other end to the RS-232C connector of your PC.

Figure 5-7. Connection to PC



Programming

1) **Serial Port 1: Data Format**Set data transmission format for Serial Port 1.

FF10 05 0001 Hold (0-7) Hold

0=7 bits -- even parity -- 2 stop bits
1=7 bits -- odd parity -- 2 stop bits
2=7 bits -- even parity -- 1 stop bits
3=7 bits -- odd parity -- 1 stop bits
4=8 bits -- no parity -- 2 stop bits
5=8 bits -- no parity -- 1 stop bits (default)
6=8 bits -- even parity -- 1 stop bits
7=8 bits -- odd parity -- 1 stop bits

2) **Serial Port 1: Data Format**Set data transmission speed for Serial Port 1.

FF10 05 0002 Hold (0-5) Hold

0=300 bps
1=600 bps
2=1200 bps
3=2400 bpss
4=4800 bps
5=9600 bps (default)

3) Serial Port 1: Protocol Set protocol for Serial Port 1.

FF10 05 0003 Hold (0-2) Hold

0=No order (default)
1=Originate mode
2=Answer mode

Call Logging Device

Guidelines

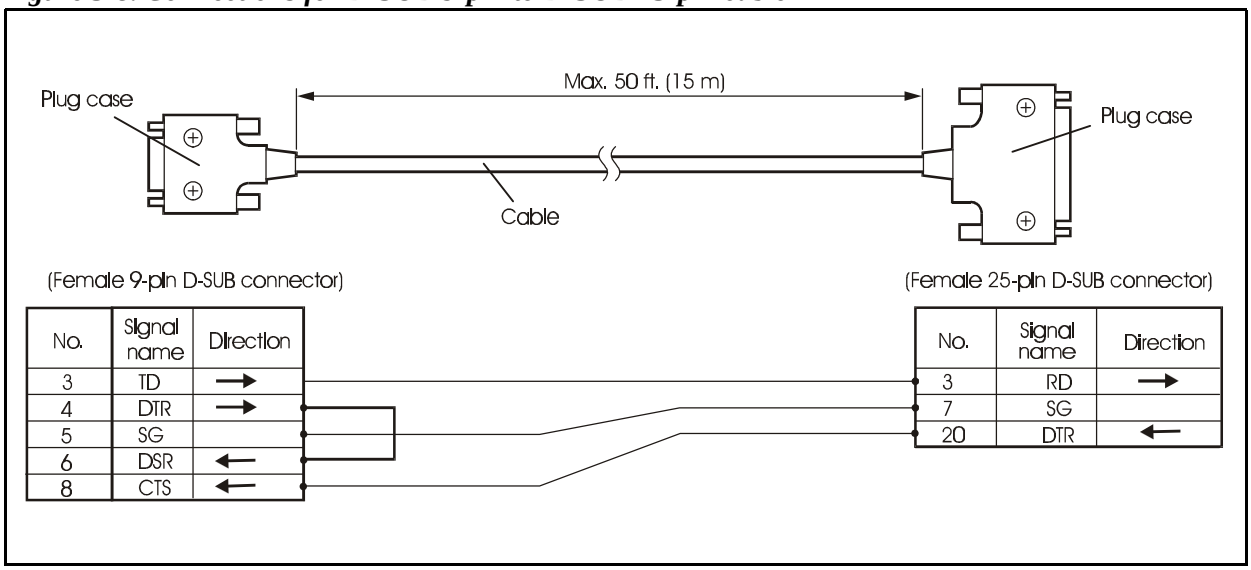
- You can connect an Call Logging device such as a call accounting machine or a printer to the mother board.
- A 9-pin to 25-pin or 9-pin to 9-pin RS-232C cable is required.
- Table 5-3 shows the pinout for the RS-232C ports (CN1 and CN2).

Making an RS-232C Cable

Depending on the RS-232C connector on your Call Logging device, you will need to make one of the following RS-232C cables.

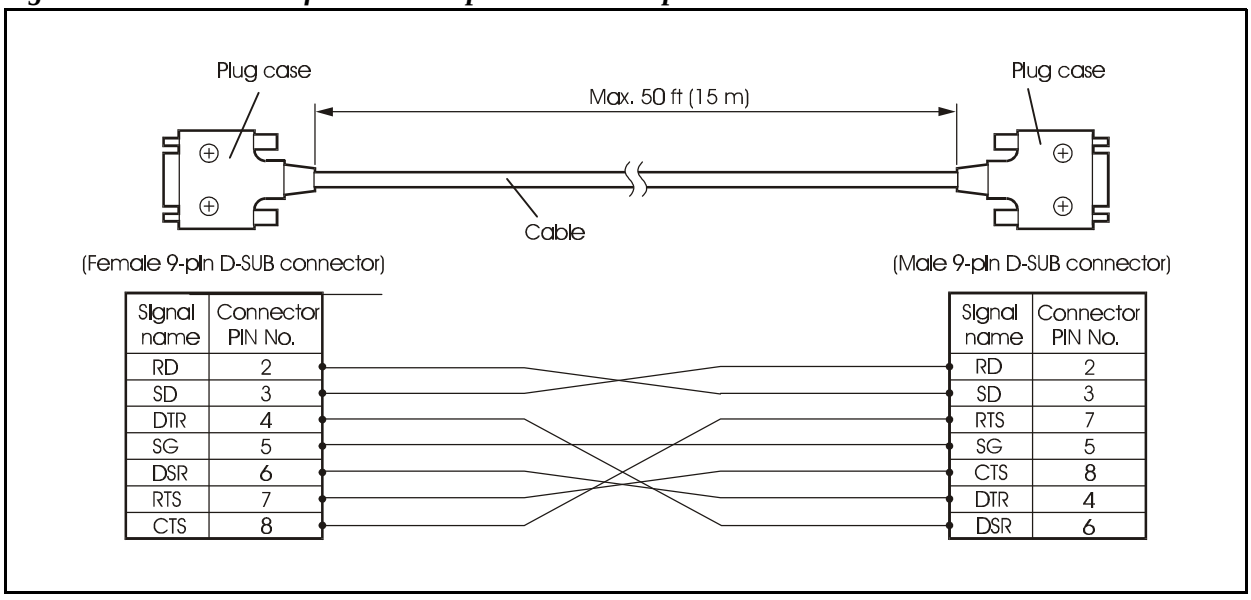
- **D-SUB 9-pin to D-SUB 25-pin:** If your Call Logging device is equipped with a 25-pin D-SUB RS-232C connector, make a cable as shown in Figure 5-8. The cable should be less than 15m long.

Figure 5-8. Connections for D-SUB 9-pin to D-SUB 25-pin cable



- **D-SUB 9-pin to D-SUB 9-pin:** If your Call Logging device is equipped with a 9-pin D-SUB RS-232C connector, make a cable as shown in Figure 5-9. The cable should be less than 15m long.

Figure 5-9. Connections for D-SUB 9-pin to D-SUB 9-pin cable — Inter-Linc Cable



Installation

1. Set switch SW1 on the CPC-HS or CPC-HM card to the Call Logging position (see Table 5-4 for details).
2. Connect the 9-pin D-SUB connector on the RS-232C cable to the P5 connector (port 1) on the mother board.
3. Pass the RS-232C cable through the wiring slot in the cabinet, then connect the 9-pin or 25-pin D-SUB connector on the other end to the RS-232C connector of your Call Logging device.

Figure 5-10. Call Logging Output data format

Format #1

T MM/DD HH:MM:SS HH:MM:SS NNNN TTT ddddddddddddddddddddddddd aaaaaaaaaa vvvvvH

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

Format #2

T MM/DD HH:MM:SS HH:MM:SS NNNN TTT ddddddddddddddddddddddddd ddddddddddddddddd

① ② ③ ④ ⑤ ⑥ ⑨ ⑦

aaaaaaaaaa vvvvv H

⑧

① Condition code (I: Incoming call / S:DISA incoming call / D: DDI incoming call / O: Outgoing call / L: LCR outgoing call / h: Hold / t: Transfer call / F: call forward outside call / W: Closed numbering call, Tandem connection call)

② Call start time (MM=01 to 12 / DD=01 to 31 / HH=00 to 23 / MM=00 to 59 / SS=00 to 59)

③ Call time (HH=00 to 23 / MM=00 to 59 / SS=00 to 59)

④ Exchange line user No. (Extension No.: 0 to 9999 / Exchange line No.: C1 to C96)

⑤ Exchange line No. (Exchange line No.: 1 to 96 / When Exchange line is disconnected while the call is on hold: *1 to *96)

⑥ Dialled No. (24 digits max.)

⑦ Accounting code (10 digits max.)

⑧ ID code (V001 to V400)

⑨ Caller data (format #2 only)

MIS Report Output

ACD card ⊗

Guidelines

⚠ **CAUTION:**
- The backup battery will last about 5 years. Be sure to replace the battery before it is exhausted.

- Connecting a personal computer (PC) to the ACD card using the RS-232C cable (supplied), allows output of MIS Reports to a printer that is connected to the PC. You cannot connect a printer directly to the ACD card for output.
- The RS-232C cable (supplied) is a 9-pin D-Sub connector. If the connection port on the PC is a 25-pin D-Sub connector, connect via a 9-pin/25-pin conversion adaptor.
- When connecting the ACD card to a PC, regular communications software must be installed on the PC.
- The ACD card cannot be removed or attached with the power turned ON. Be sure to turn the power OFF before removing or attaching the ACD card.
- The supplied cable will only work with ACD. The cable will not support Call Logging or PC Customization Tool.
- For details on ACD, refer to ***Section 520: Built-In ACD Reference Manual.***

• MIS Report (Management Information System)
  (1) Agent Activity (Tabulated by Agent Basis)
  (2) Group Activity (Tabulated by Agent Group Basis)
  (3) System Activity (Tabulated by the ACD System Basis)
  (4) Work Unit Count (Tabulated on a daily/weekly Basis)

(**ex. All Agents - Daily)**

```
REPORT TYPE:   DAILY ALL AGENT REPORT (THIS WEEK)       Fri 22/11/1996 10:00
OUTPUT RANGE:  Mon 18/11/1996  TO  Tue 22/11/1996
AGENT NO 1: ID=0001

DATE                  18(Mon) 19(Tue) 20(Wed) 21(Thu) 22(Fri)   (Sat)   (Sun)
LOGIN TIME [HH:MM]     24:00   24:00   24:00   24:00   24:00
UNAVAL TIME[HH:MM]     24:00   24:00   24:00   24:00   24:00
TALK TIME  [HH:MM]     24:00   24:00   24:00   24:00   24:00
IDLE TIME  [HH:MM]     24:00   24:00   24:00   24:00   24:00
IDLE TIME PERCENT       100%    100%    100%    100%    100%
INCOMING ACD CALL        255     255     255     255     255
ANSWERD CALL             255     255     255     255     255
AVG. RINGING TIME[SEC] 86400   86400   86400   86400   86400
```

(**ex. All Agents - Hourly**)

REPORT TYPE: HOURLY ALL AGENT REPORT Fri 22/11/1996 10:00
OUTPUT RANGE: Mon 18/11/1996 TO Tue 19/11/1996
AGENT NO 1: ID=0001

DATE Mon 11/18/1996

TIME(HOUR)	[00]	[01]	[02]	[03]	[04]	[05]
LOGIN TIME [MM]	60	60	60	60	60	60
UNAVAL. TIME[MM:SS]	60:00	60:00	60:00	60:00	60:00	60:00
TALK TIME [MM:SS]	60:00	60:00	60:00	60:00	60:00	60:00
IDLE TIME [MM:SS]	60:00	60:00	60:00	60:00	60:00	60:00
IDLE TIME PERCENT	100%	100%	100%	100%	100%	100%
INCOMING ACD CALL	255	255	255	255	255	255
ANSWERD CALL	255	255	255	255	255	255

TIME(HOUR)	[18]	[19]	[20]	[21]	[22]	[23]
LOGIN TIME [MM]	60	60	60	60	60	60
UNAVAL. TIME[MM:SS]	60:00	60:00	60:00	60:00	60:00	60:00
TALK TIME [MM:SS]	60:00	60:00	60:00	60:00	60:00	60:00
IDLE TIME [MM:SS]	60:00	60:00	60:00	60:00	60:00	60:00
IDLE TIME PERCENT	100%	100%	100%	100%	100%	100%
INCOMING ACD CALL	255	255	255	255	255	255
ANSWERD CALL	255	255	255	255	255	255

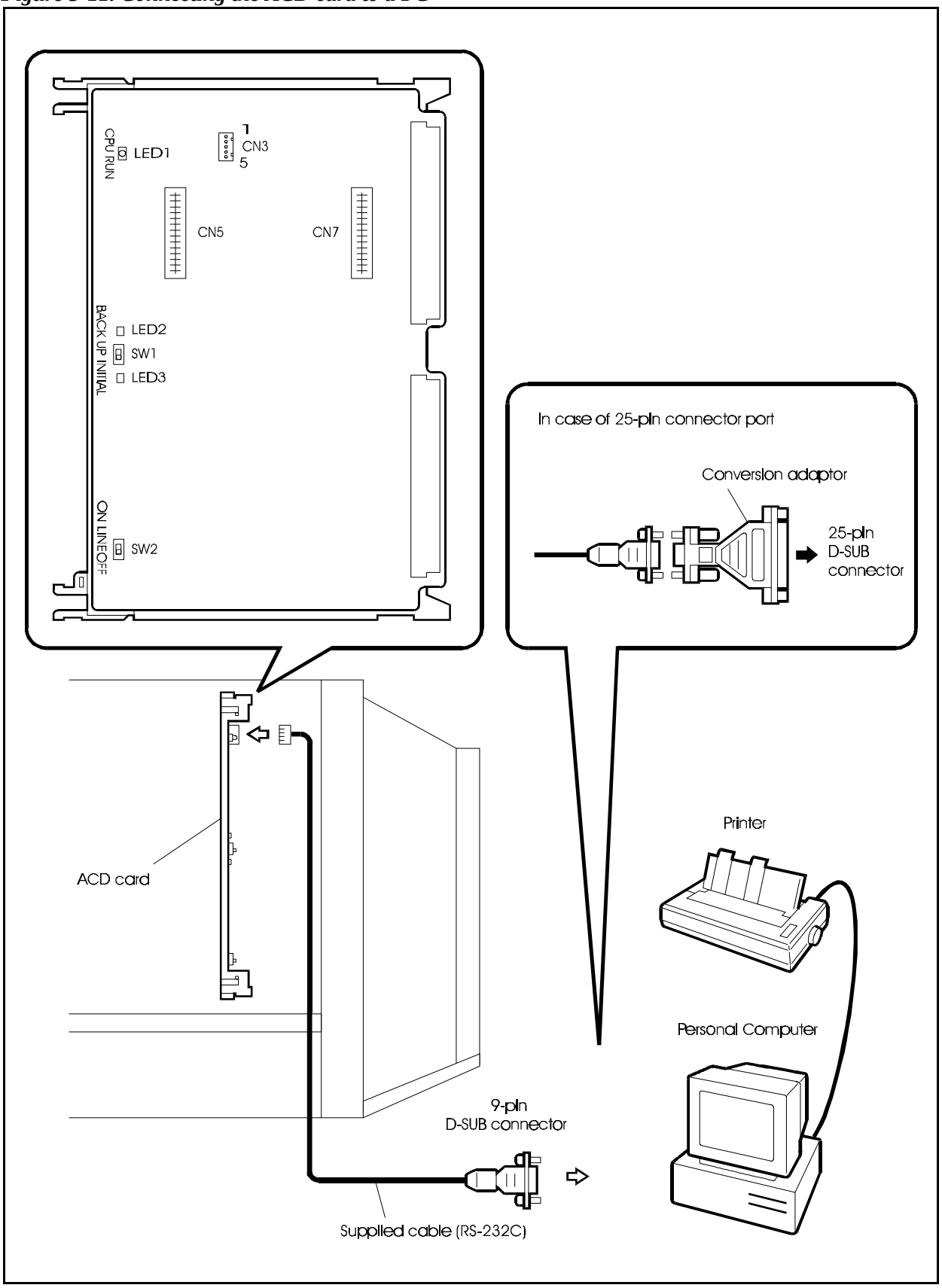
Installation

1. Connect the 5-pin connector of the RS-232C cable (supplied) to CN3 on the ACD card.

2. Pass the RS-232 cable through the wiring hole on the cabinet, and connect the D-Sub 9-pin connector to the RS-232 port of the PC.

Note: If the connection port is a 25-pin D-Sub connector, connect via a 9-pin/25-pin conversion adaptor.

Figure 5-11. Connecting the ACD card to a PC



Application Interface (API)

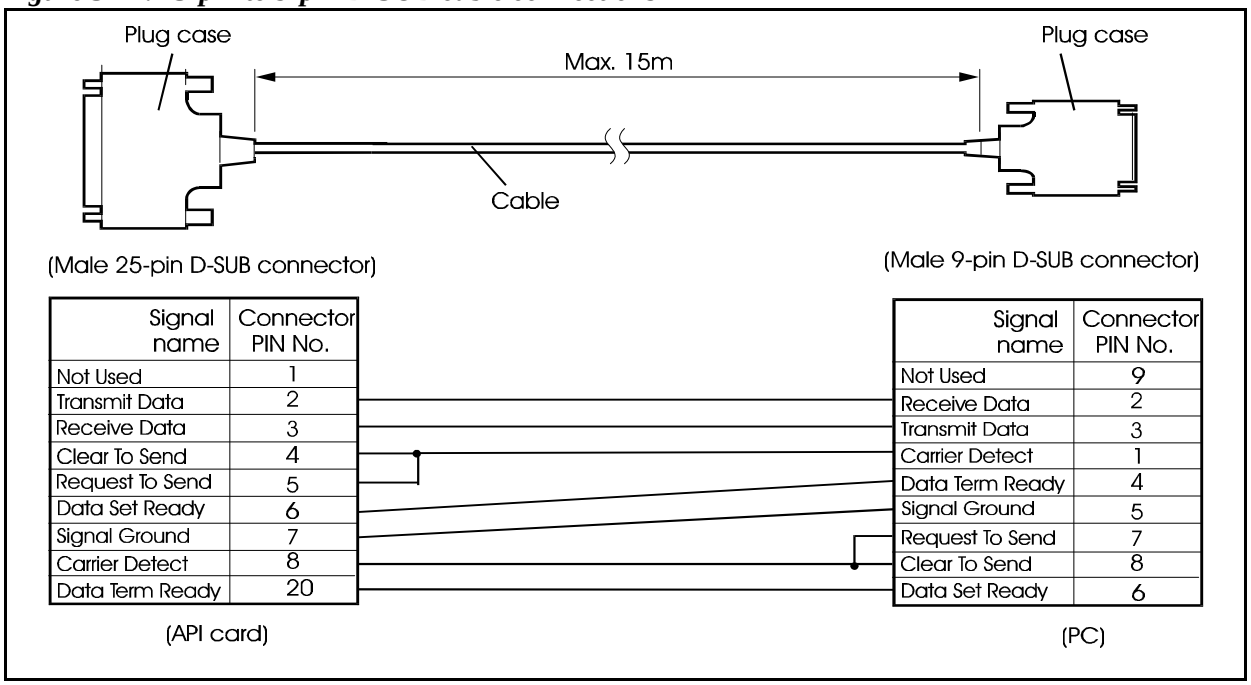
Guidelines

- The application interface (API) card enables data from a range of applications such as voice mail and ACD to be sent to a PC.
- Control is provided by the RS-232C interface.
- The maintenance switch (SW1) on the API card can be set so that the card can be installed and removed while the main cabinet is operating. See *"Maintenance Switches"* on page 4-2 for details.
- The API card performs a self test when the test mode switch (SW401) is ON.
- Setting the RAM HOLD switch (SW3) OFF deletes data from the API card memory. When this switch is ON, the backup battery ensures that the data is retained in memory.

Preparing an RS-232C cable

- See the following figure for details of how to prepare a 25-pin D-SUB to 9-pin D-SUB RS-232C cable if one is not supplied.

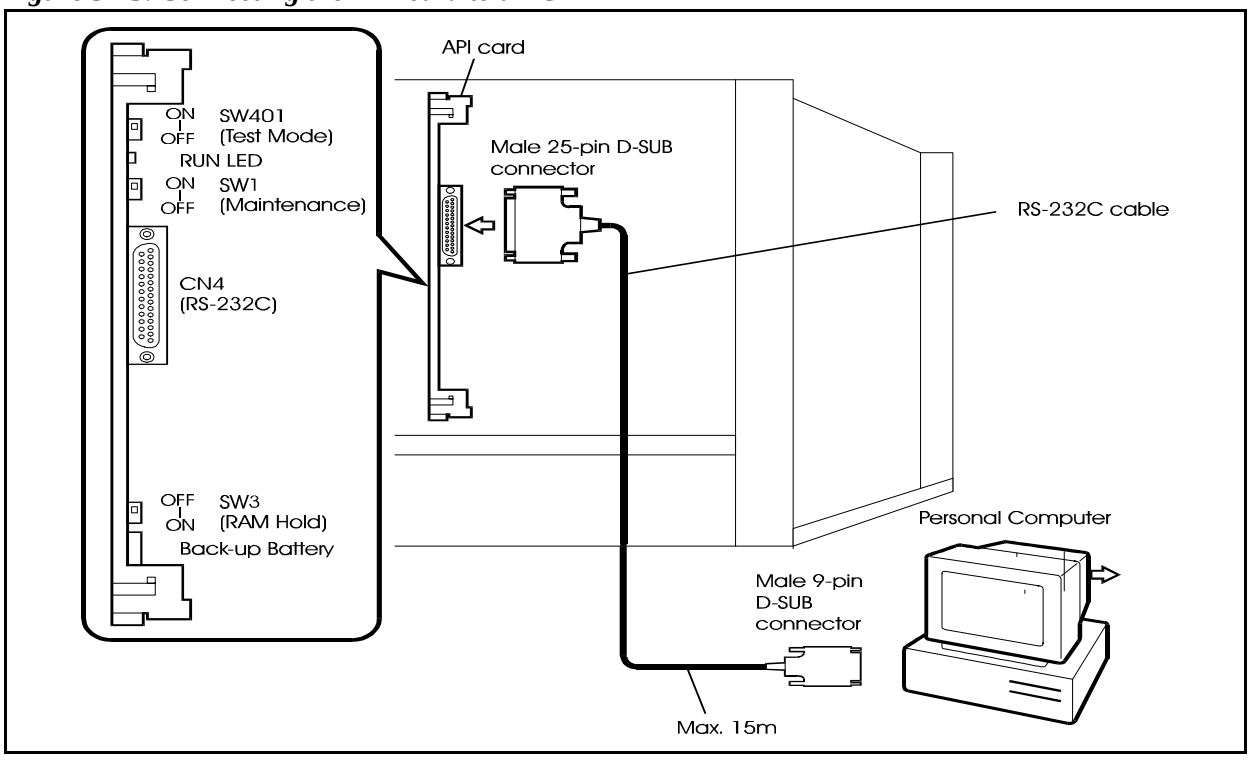
Figure 5-12. 25-pin to 9-pin D-SUB cable connections



Installation

1. Install the API card in an available optional card slot or flexible slot.
2. Connect one end of the RS-232C cable to the RS-232C port (CN4) of the API card and the other end to the PC.

Figure 5-13. Connecting the API card to a PC



Headset

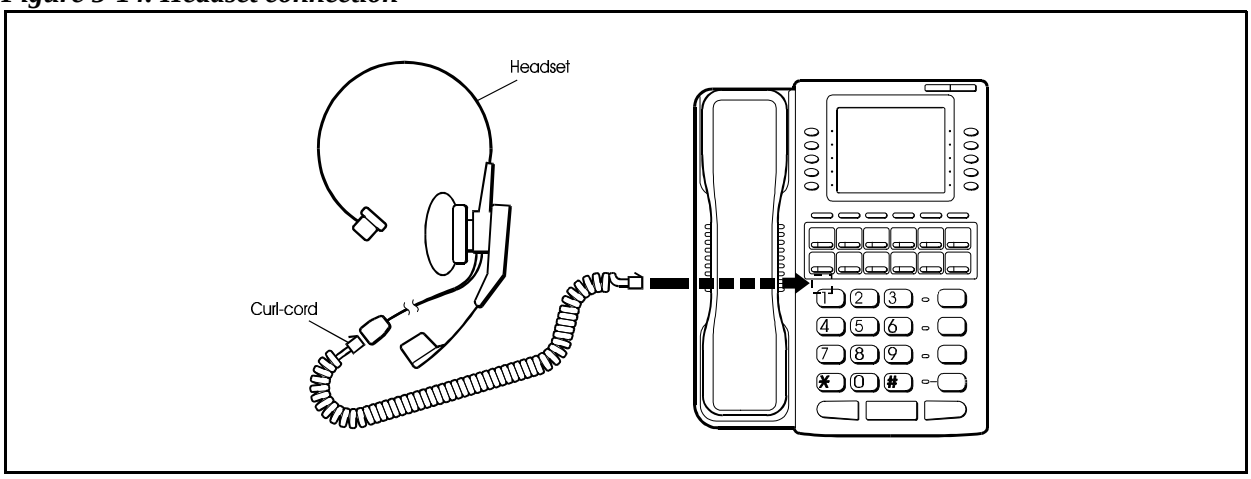
Guidelines

- A headset (VB-2394) can be connected in place of the telephone's handset.
- Please talk to Panasonic Sales for an information of available headset.

Installation

1. Remove the curly cord from the handset.
2. Replace the curly cord with the headset's modular connector.

Figure 5-14. Headset connection



Operation

1. Switching to headset mode

Switch the phone to headset mode.

Press the following keys: [ON/OFF] , [PROG] [9] [0] , [ON/OFF]

2. Making and receiving calls

Press the following key to talk: [ON/OFF]

3. Ending a call

Press the following key to end a call: [ON/OFF]
(The phone is now ready to receive a call.)

Condition F In case of A-series key phone, Headset Adaptor (VB-5331) is required for the headset(VE-2394).

Voice Recognition Adaptor

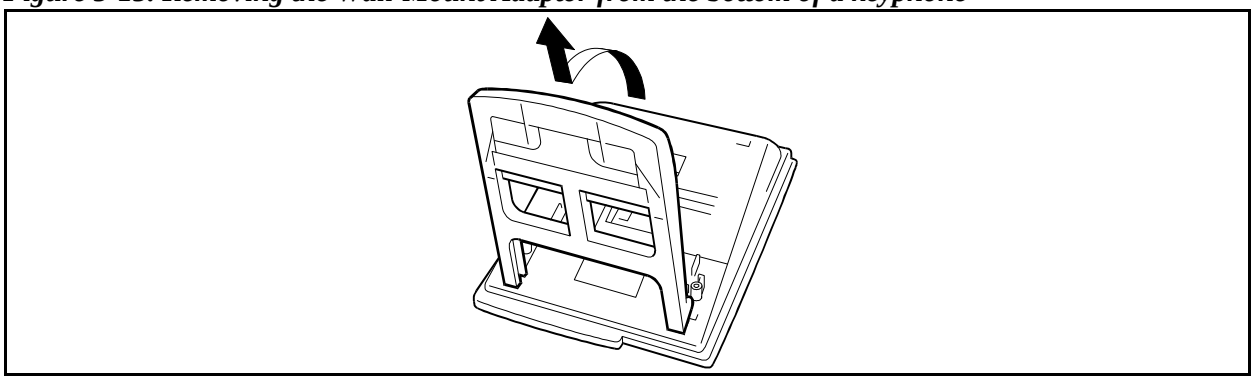
Guidelines

- A VB-44101 voice recognition adaptor can be installed in the VB-D411DSVUK key phone so that the phone can be used as a voice recognition phone.
- You can call by name or execute other functions by function names.
- Locate the Voice Recognition Adaptor within 120m of the cabinet. The maximum loop circuit resistance to a Voice Recognition Adaptor is 20 Ohms.
- When the Voice Recognition Adaptor is installed, the telephone cannot be wall mounted.
- When the Voice Recognition Adaptor is installed, a DSS or EM24 cannot be attached to the case.

Installation

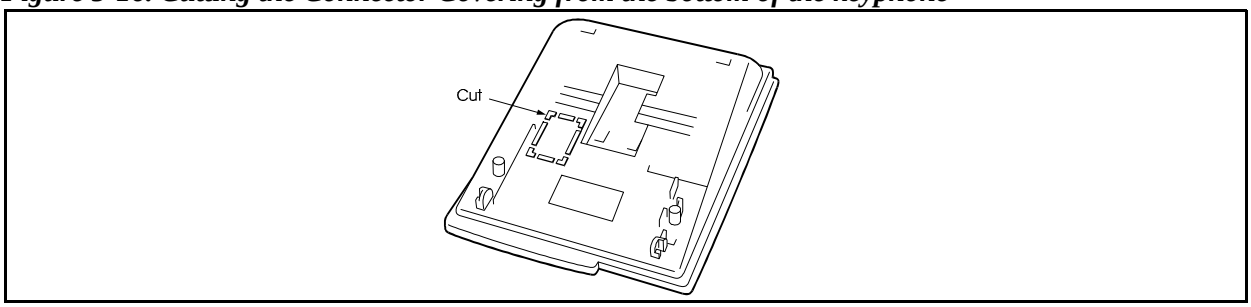
1. Remove the wall-mount adaptor from the bottom of the phone, taking care not to damage the hooks.

Figure 5-15. Removing the Wall-Mount Adaptor from the bottom of a keyphone



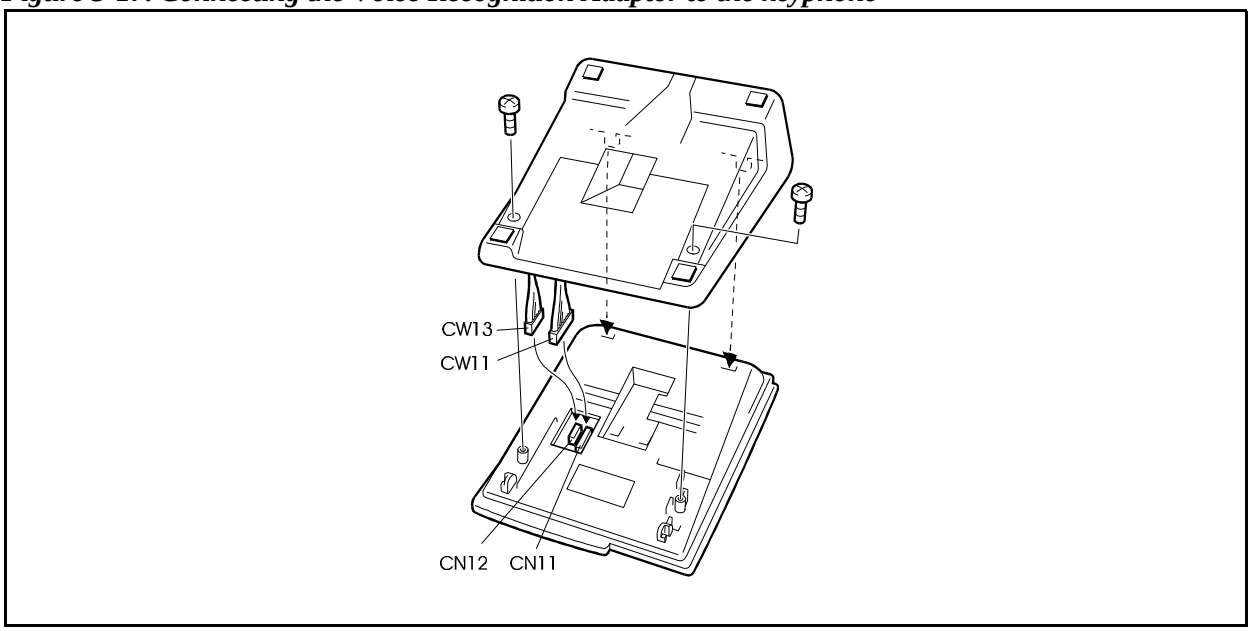
2. Cut the connector covering from the bottom of the phone to expose the connectors (CN11 and CN12).

Figure 5-16. Cutting the Connector Covering from the bottom of the keyphone



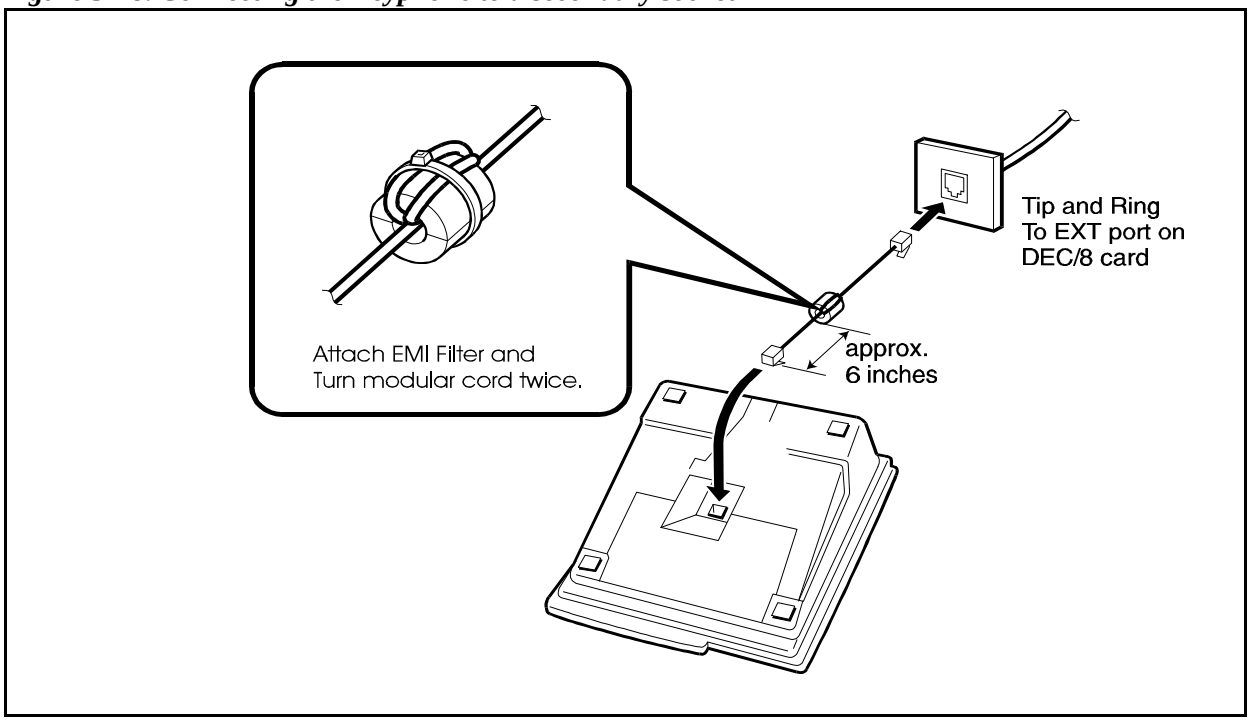
3. Connect one end of the CW11 and CW13 cables provided with the voice recognition adaptor to connectors CN11 and CN12 in the bottom of the phone.
4. Secure the voice recognition adaptor using the two screws.

Figure 5-17. Connecting the Voice Recognition Adaptor to the keyphone



5. Connect the phone to the internal line port on a DEC/8 card.

Figure 5-18. Connecting the Keyphone to a secondary socket



Key Telephone Wall Mounting

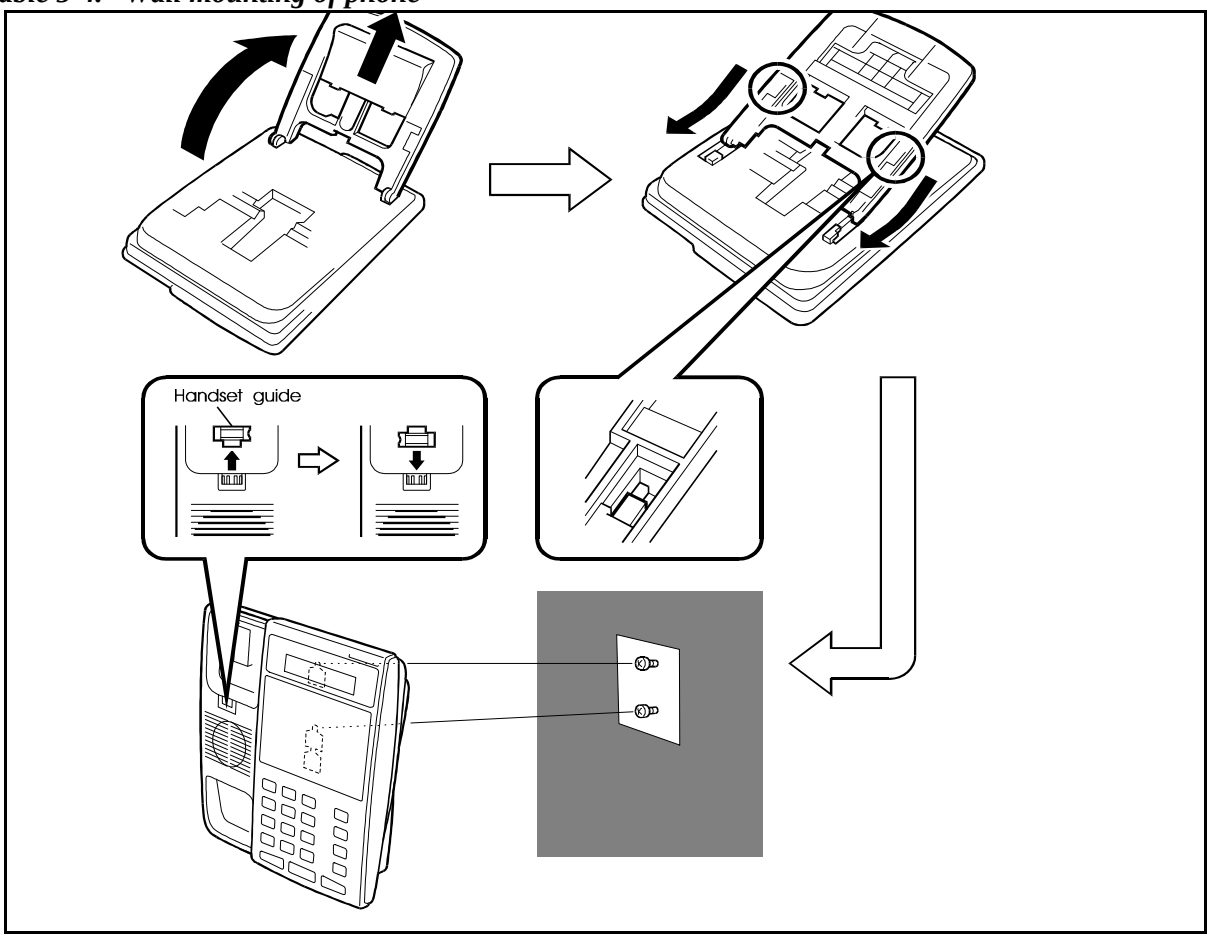
Guidelines

- S-ICX keyphones can be mounted on the wall using the wall mounting adapter on the bottom of the phone.

Installation

1. Remove the wall mounting adapter from the bottom of the phone taking care not to damage the adapter hooks.
2. Rotate the wall mounting adapter by 180 degrees, then slot it into the two guides.
3. Remove the handset guide, rotate it by 180 degrees, and replace it.
4. Insert two screws in the wall.
5. Hook the two mounting holes on the bottom of the phone onto the two screws in the wall.

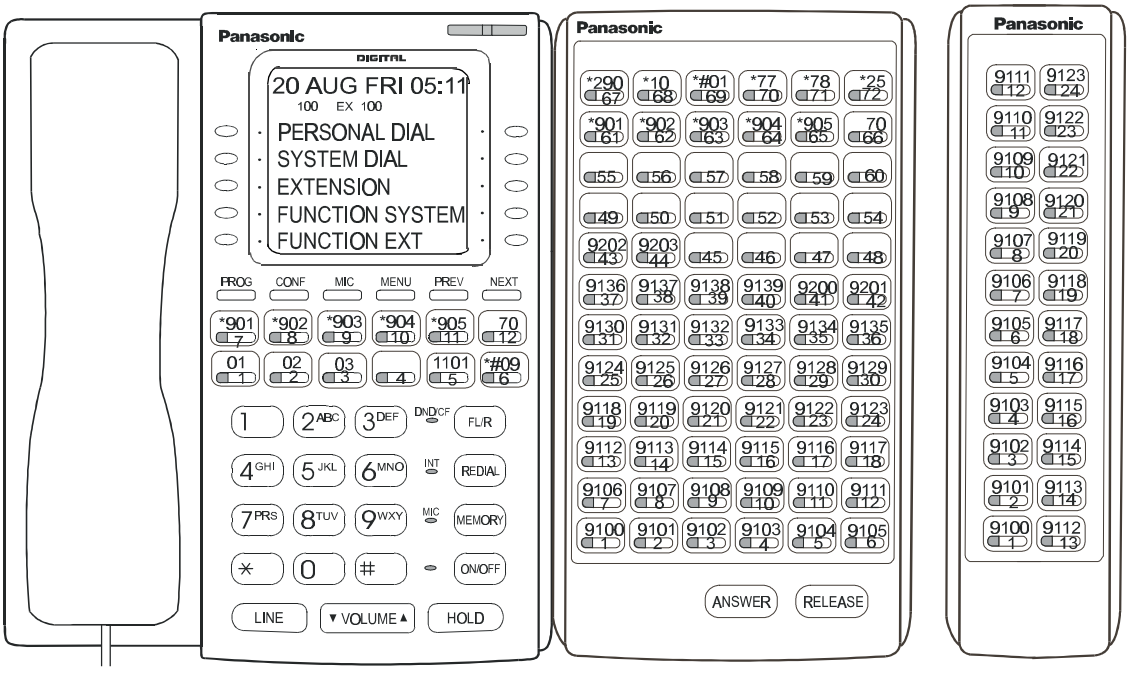
Table 5-4. Wall mounting of phone



DSS

Guidelines

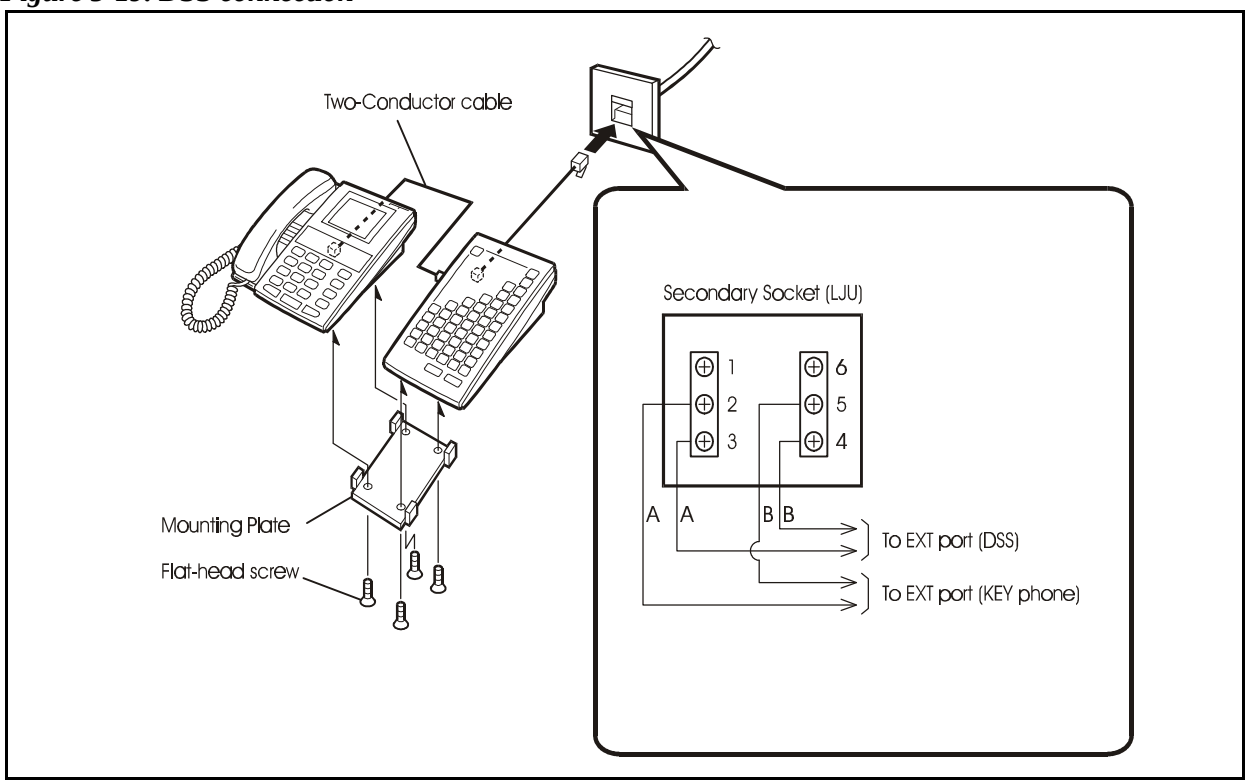
- The DSS (VB-D631UK) is a 72-key console that can be attached to the attendant phone. It provides direct station selector and busy lamp fields for extensions.
- The DSS comes with an angle adaptor, screws, and a two-conductor cable for connecting the DSS to the key phone.
- Locate the DSS within 120m of the CCU. The maximum loop circuit resistance to a DSS is 20 ohms.
- The DSS cannot be mounted on the wall.



Installation

1. Attach the DSS to the key phone using the mounting plate and the four screws.
2. Connect the DSS to the key phone using the two-conductor cable.
3. Connect the DSS to the secondary socket using a four-conductor cable.

Figure 5-19. DSS connection



4. Secondary socket requires 4 wires to DEC card taking 2 ports; 1 for the DSS, 1 for the associated telephone.

EM24

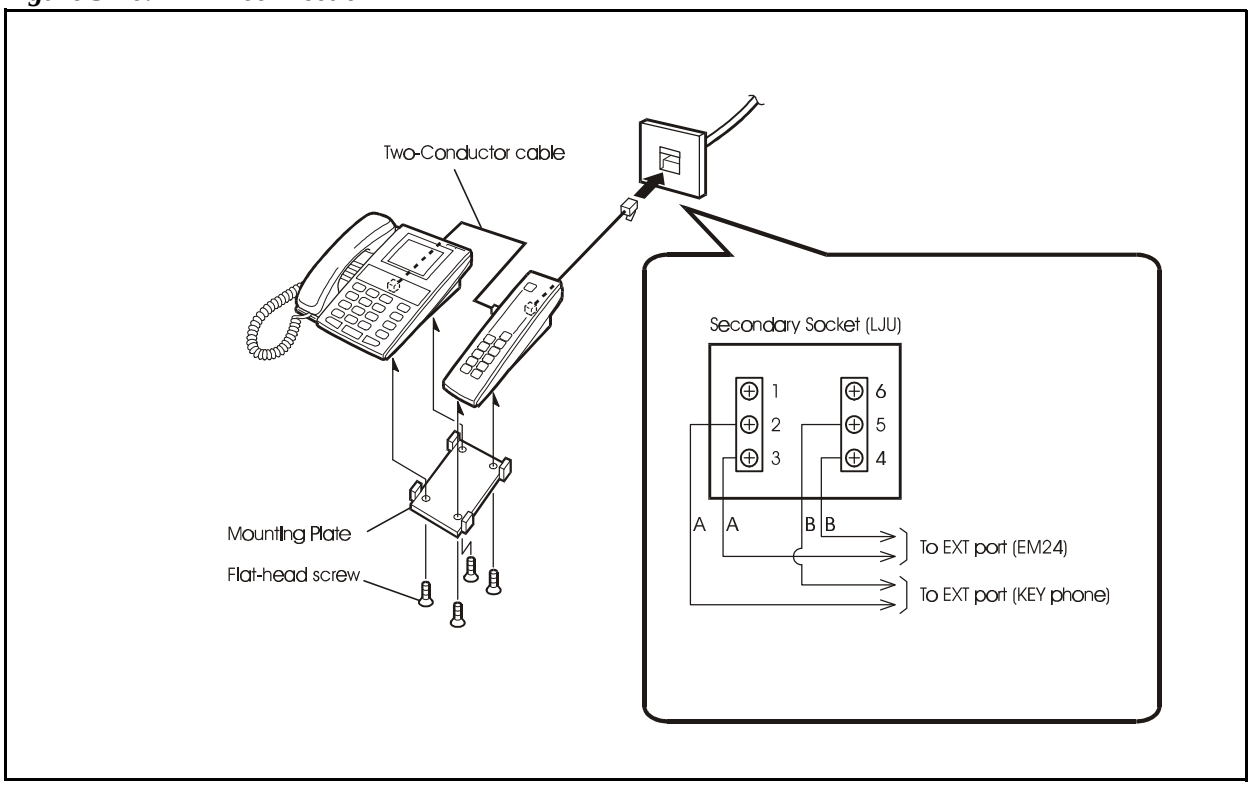
Guidelines

- The EM24 (VB-D331UK) provides 24 flexible function (FF) keys. It can be attached to any key phone.
- The EM24 comes with an angle adaptor, screws, and a two-conductor cable for connecting it to the key phone.
- Locate the EM24 within 120m of the CCU. The maximum loop resistance to a EM24 is 40 ohms.
- The EM24 cannot be mounted on the wall.

Installation

1. Attach the EM24 to the key phone using the mounting plate and the four screws, as shown in Figure 5-19.
2. Connect the EM24 to the key phone using the two-conductor cable.
3. Connect the EM24 to the secondary socket using a four-conductor cable.
4. Secondary socket requires 4 wires to DEC card taking 2 ports; 1 for the DSS, 1 for the associated telephone.

Figure 5-20. EM24 connection



Doorphone Adaptor

CAUTION:
- Turn the power switch and the external breaker OFF, and disconnect the AC cable before installing the Doorphone Adaptor.

Guidelines

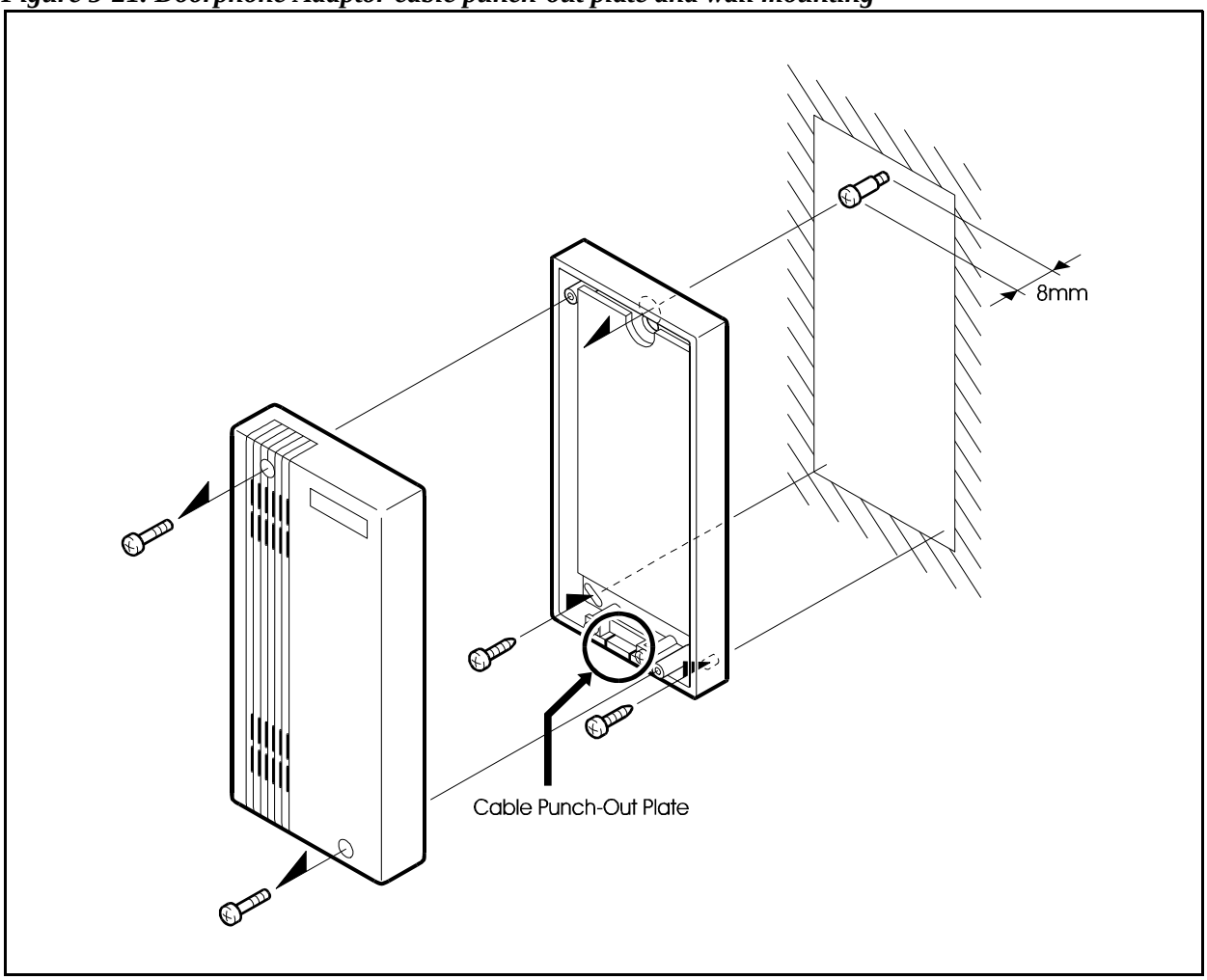
- The Doorphone Adaptor (VB-3473UK) can accommodate two doorphones (VL-568GPEX, VL-582APEX) and two door openers. Door openers are not sold by Panasonic, but can be purchased separately from an electronics dealer.
- Each Doorphone and door opener uses one exchange line port.
- One or two door openers and Doorphones can be connected to a Doorphone Adaptor.
- The Doorphone can be set to call for 15 seconds, 30 seconds, or one minute.
- The Door opener can be set to open for one second, 3seconds, or 5 seconds.
- The maximum permissible wiring distance between the Doorphone Adaptor and a LTRK/8 card is limited to a maximum loop resistance of 20 ohms, 120M.
- The maximum permissible resistance of the wiring between the Doorphone Adaptor and Doorphone is 20 ohms.

Installation

1. Remove the cover from the Doorphone Adaptor.
2. Set the switches in the Doorphone Adaptor according to Figure 5-21.
3. Remove the cable punch-out plate (Figure 5-20) in order to make an opening for the cables coming into the Doorphone Adaptor.

   To remove the plate, cut the groove with diagonal cutters, then bend the plate back and forth with needle-nose pliers to remove it.
4. Mount the Doorphone Adaptor on the wall using the three screws provided with the unit.

Figure 5-21. Doorphone Adaptor cable punch-out plate and wall mounting

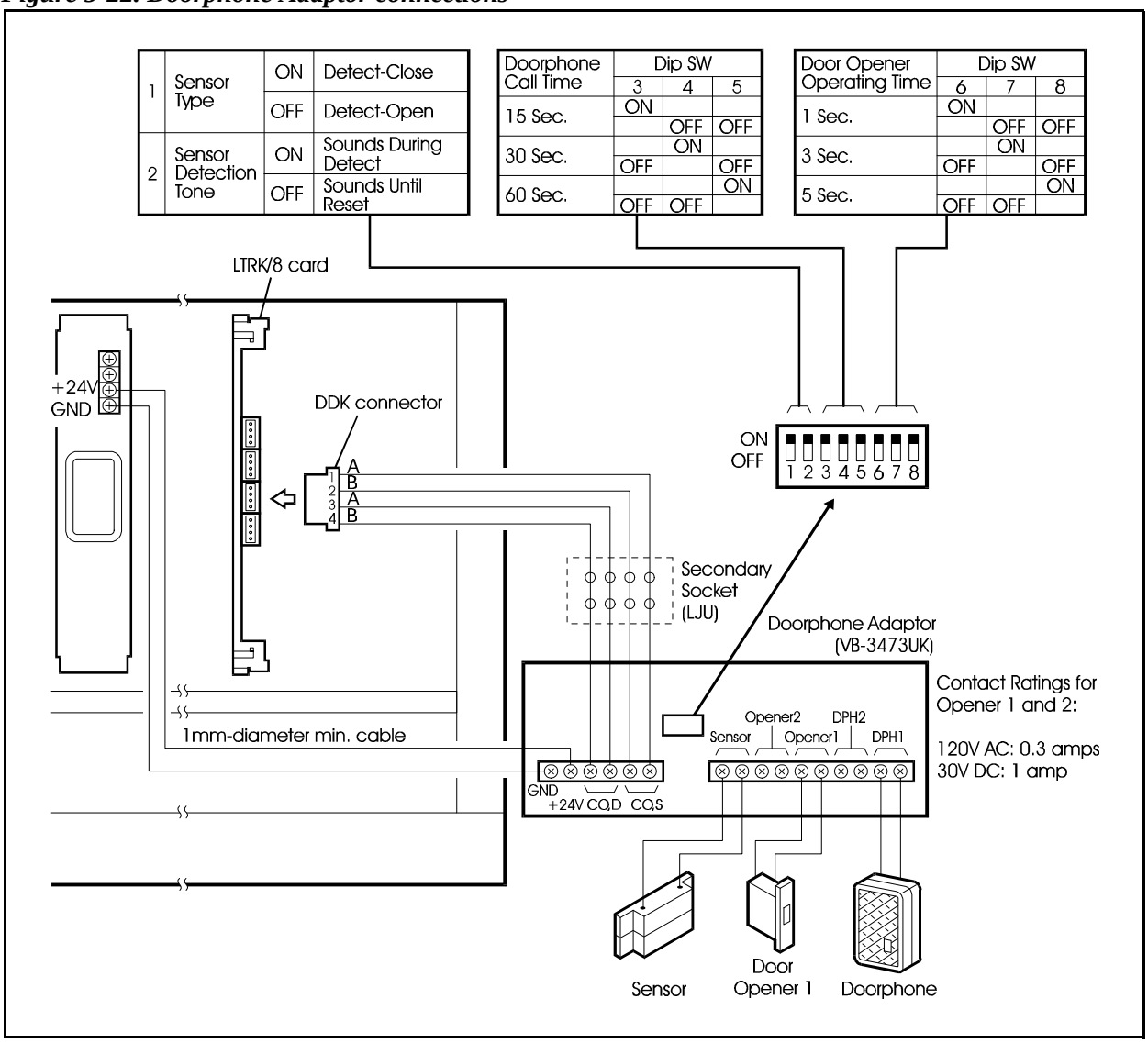


5. Connect the exchange line(s) to the Doorphone Adaptor, as shown in Figure 5-21.

   The “CO.D” connector is used for the Doorphone and opener. The “CO.S” connector is used for the sensor.

6. Connect the Doorphone, door opener, and sensor to the Doorphone Adaptor.

Figure 5-22. Doorphone Adaptor connections



1 Line SLT Adaptor

Guidelines

- By connecting the 1 line SLT Adaptor to the DEC/8/16/24 card, you can connect an SLT instead of an extension key phone.
- One SLT can be connected to 1 line SLT Adaptor unit.
- To facilitate maintenance, attach the 1 line SLT Adaptor near to the main cabinet.
- Wiring resistance:

  Between CCU and adapter: loop 20 ohms

  Between adapter and SLT: 1.6 km (when 0.5 mm wire is used)

  SLT impedance should be 120 ohms or more.

Installation

1. Remove the cover from the 1 line SLT Adaptor.
2. Remove the cable punch-out plate (Figure 5-24) in order to make an opening for the cables coming into the 1 line SLT Adaptor.

   To remove the plate, cut the groove with diagonal cutters, then bend the plate back and forth with needle-nose pliers to remove it.
3. Mount the 1 line SLT Adaptor on the wall using the three screws. (Screws are not provided with the unit.)
4. Use the DDK connector to connect the T and R terminals on the 1 line SLT Adaptor terminals to the A and B terminals on the DEC/8/16/24 card.
5. Connect the 5-pin and 2-pin terminals in the Master Socket to terminals TT and TR on the 1 line SLT Adaptor.
6. Use the station cord to connect the SLT to the Master Socket.

Figure 5-23. 1 line SLT Adaptor cable punch-out plate and wall mounting

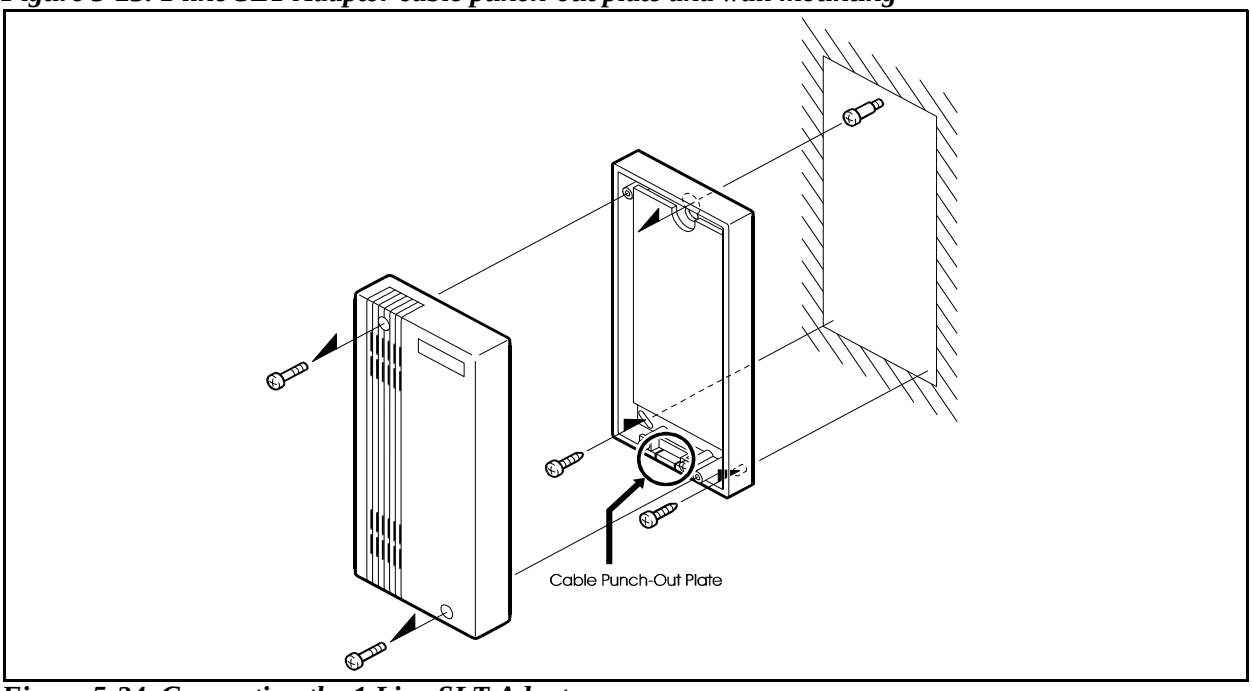
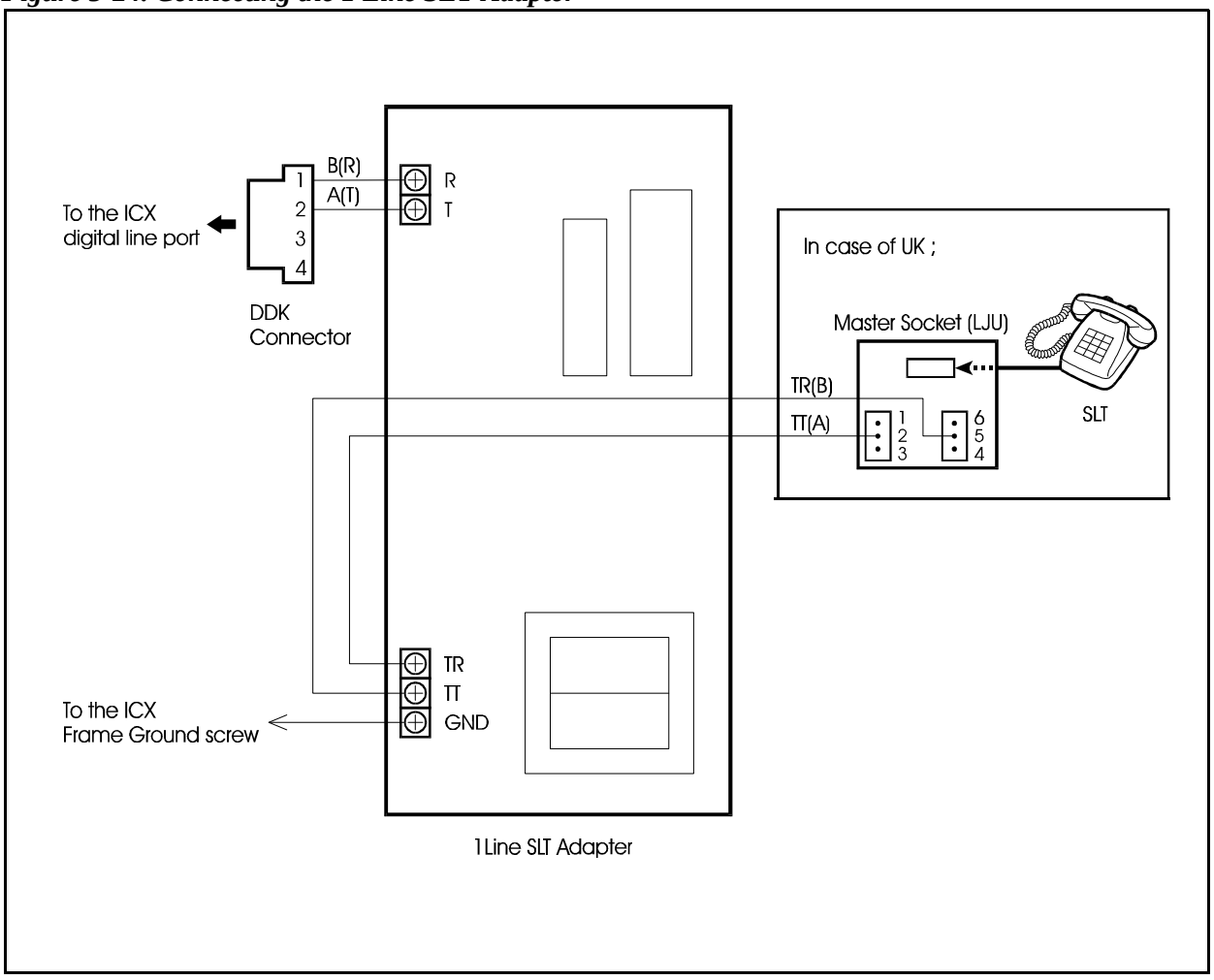


Figure 5-24. Connecting the 1 Line SLT Adaptor



Replacing the CPC Card's Backup Battery

Guidelines

CAUTION:

- Turn the power switch off and make certain the AC cable is disconnected before replacing the backup battery.
- The backup battery will last about 7 years. Be sure to replace the battery before it is exhausted.
- Once the backup battery is disconnected, you have approximately 60 seconds to connect a new battery before stored data is lost.
  Danger of explosion if battery is incorrectly replaced.
- Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- The backup batteries on the CPC-HS and CPC-HM cards will back up data such as program settings, speed dialing data, and the date and time in the event of a power failure. Be sure to replace the backup batteries before they are exhausted.
- To prevent data from being lost, please back up data to the PCAS (PC-customized tool) before replacing the backup battery.

Installation

1. Connect the new backup battery to the P7 connector on the CPC-HS and CPC-HM cards.
2. Cut a tie-wrap using nippers to remove the old backup battery.
3. Secure the new backup battery using a tie wrap.

Note: Secure the battery so that it cannot move.

Figure 5-25. Replacing the backup battery of a CPC card

Note: A clear protective shield is present around the battery. However, this shield is not shown to better illustrate the battery position. This will not interfere with the battery replacement.

- **CPC-HS and CPC-HM card**